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REPORT ON

SEVEN YEAR DEVELOPMENT PLAN

FOR THE

PLAN ORGANIZATION

OF THE

IMPERIAL GOVERNMENT OF IRAN

VOLUME I

SUMMARY AND GENERAL CONCLUSION

OVERSEAS CONSULTANTS, Inc.
NEW YORK
1949

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SUMMARY AND GENERAL CONCLUSION

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Gift from Mr. Janssen

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OVERSEAS CONSULTANTS, INC.
51 EAST 42ND STREET
NEW YORK 17, N. Y.

August 22, 1949
(31 Mordad 1328)

Managing Director,
Plan Organization,
Imperial Government of Iran,
Tehran, Iran.

Dear Sir:

Under date of February 1, 1949 (12 Bahman 1327), the undersigned, Overseas Consultants, Inc., hereinafter referred to as OCI, entered into a contract with the Imperial Government of Iran for rendering certain services in connection with Iran's Seven Year Development Plan.

As set forth in our contract, our services were to include, but not to be limited to, the following:

A thorough analysis of the industrial plants both Governmental and private, including manufacturing, transportation, communication, ports, highways, and mines, whether actually existing or contemplated.

A thorough study of the agricultural and irrigation conditions of the country as presently operating and their possibilities of extension and improvement.

Consideration of ways and means for increasing the production of minerals.

A study of social institutions and services, including education, health, housing, water supply, sanitation, and similar matters.

A review of the presently established allocation of the over-all appropriations to the several elements of the Seven Year Plan by categories.

We were assisted in our work by the engineering firm, Sir Alexander Gibb & Partners, of London.

Under the terms of a previous contract dated October 7, 1948 (15 Mehr 1327) we submitted a brief preliminary report dated January 12, 1949 (22 Dey 1327) based upon a short study of conditions in Iran made during November and December 1948 (Aban and Azar 1327). Upon completion of the field work under the present contract, we submitted an interim report dated May 16, 1949 (26 Ordibehesht 1328), briefly outlining our preliminary findings and recommendations. We now submit our completed report, which for convenience is presented in five volumes as follows:

Volume I —Summary and General Conclusion

Volume II —Public Health
Education

Volume III —Agriculture
Water Resources
Meteorology
Surveying and Mapping
Town Improvement and Housing

Volume IV —Transportation
Communications
Industry and Mining
Electric Power
Petroleum

Volume V —Organization
Statistical Organization
Distribution
Legal Matters
Economic Problems

During the course of the work our engineers and other experts visited all the important areas of Iran. They inspected both Government and privately-owned industrial plants, mines, power plants, water supply sites, transportation facilities, communication facilities, ports, agricultural and tribal areas, hospitals and schools. They held discussions with Government officials and leading citizens in the areas visited and with plant managers and others well informed as to local conditions. In practically every instance, our representatives were accompanied on their field trips by members of the Provisional Planning Board or Plan Organization or by a delegated representative of the Ministry concerned. We enjoyed the close co-operation and courtesy not only of the Plan Organization personnel, but also of Government officials and others in authority who were most helpful in placing information and data at our disposal and in giving us the benefit of their knowledge and experience. Without such help and co-operation, completion of our task would have been impossible. For all of this, we wish to express our sincere appreciation.

Respectfully submitted,

OVERSEAS CONSULTANTS, INC.

Chairman of the Board

President

INTRODUCTION

The conception of the Seven Year Plan indicates awareness on the part of the Government of Iran of world conditions and of the necessity for any country, which wishes to retain its independence and way of life, to raise the standard of living of its people. The Plan is a bold and constructive step toward this end. It is essential not only that the Iranian standard of living be raised, but that it be done with as little delay as possible.

Conditions throughout the world have changed greatly within the last decade. Transportation and communications are now such that even the most isolated peoples are becoming increasingly well informed as to conditions in other countries. They can readily compare their living standards with those of other lands and are unlikely to remain satisfied unless they can see hope of improvement in their own.

The recent war has brought about tremendous change, particularly in Asia. These countries long under the control of others have regained their independence and are now faced with the task of establishing new domestic economies and developing their natural resources for their own benefit. The Near East and Middle East countries, including those which received their independence before the last war, are working to this end.

With a cultural background and independent national existence extending for thousands of years, Iran should rightly be among the leaders in this movement. Its contributions to art and literature have been outstanding and the fame of its skilled artisans in ceramics, rugs, and metal has been worldwide. The Iranian people are proud of their heritage and intensely loyal to their country.

Iran is somewhat larger in area than France, Spain, Portugal, Italy, Switzerland, Belgium, and Holland combined, but its population is small. Distances are great and the natural obstacles of rugged mountain ranges and a vast central desert area render transportation and communication difficult. The country has large petroleum resources, but the full extent of its mineral wealth is unknown, as systematic geological and geophysical surveys have not been made. Its variations of soil and climate make it suitable for producing a wide variety of valuable foods and industrial crops. For convenience of reference there is attached hereto as Exhibit 1 a map of Iran showing ostan boundaries and principal cities.

The Government is in a sound financial position, having only certain small external and internal debts which are relatively unimportant. Its needs for foreign exchange have been more than met through its oil revenues and it has a substantial balance of foreign exchange.

During the reign of Reza Shah Pahlevi the development of Iranian industry along modern lines was begun. A railroad was constructed from the Persian Gulf to Tehran and the Caspian sea and extended toward Tabriz and Meshed. A road construction program was started and many new industrial enterprises were established. These developments reached their peak in the period from 1309 to 1319 (1930 to 1940) and, considering the lack of technical knowledge among Iranians, good progress was made. The advent of war brought about an abrupt termination of development. The plants were operated at a high rate of production throughout the war and immediate postwar years without adequate maintenance, which has resulted in serious deterioration of their equipment and general condition.

Agricultural methods in Iran are primitive, modern farm machinery is but little used, and large areas which could be used to produce useful crops are idle. The land areas worked by individual peasants and their families, almost always as tenants of absentee landowners, are small. These landowners as a general rule seem reluctant to invest the earnings of their land in improvements, preferring to spend their time and incomes in the towns and cities where they reside. As a result, farm yields are low and the tenants' scale of living is not far above a bare subsistence level.

Irrigation is needed in many areas. Lack of control of plant diseases and pests results in great damage to field and horticultural crops, and the annual loss of livestock due to inadequate feed, poor management practices, and the existence of parasites and disease is large. Much of the valuable crop of fruits and nuts is wasted due to inadequate processing and grading equipment. The value of a large part of the land has been impaired by over-grazing and wasteful forestry methods.

Until relatively recent times, education in Iran was extremely backward and, despite commendable progress made within the past 40 or 50 years, particularly during the reign of Reza Shah Pahlevi, the standard of education remains low. The raising of the general level of educational standards, particularly among the rural and poorer classes, would be of incalculable value to the general economy of the country. A particular need is for the training of skilled and semi-skilled workers in various trades, especially those needed for the installation, maintenance, and operation of modern industrial equipment.

As in most underdeveloped countries, the national health presents a grave problem. Lack of statistical data makes it impossible to estimate the extent to which various diseases affect the productivity and general well-being of the population, but it is obvious that the institution of modern hygienic methods would be of inestimable benefit. From 11 million to 12 million of the rural population have no medical service. Sanitary disposal methods and water supply are primitive even in the largest cities. There is a vital need for personnel well trained in public health administration, engineering, and laboratory methods.

The population of Iran is composed of a small ruling class of wealthy families, a relatively small and uninfluential middle class, and a large proportion of peasants, city dwellers, and nomads who are poor and badly educated.

In spite of the low standard of living of the bulk of the population they are naturally intelligent and industrious.

The investments of the wealthy are largely in land, revenue-producing real estate, or relatively small privately-controlled businesses. Trained for generations as traders and merchants, they do not seem to have confidence in long-term investments, and the practice of investing in the shares of enterprises controlled by others is practically non-existent. A sense of responsibility, normal to those answerable for the safety and the gainful employment of the investments of others, such as is common to the managements of western industrial enterprises, has not been developed. An unfortunate corollary of this is laxness in fulfillment of legal obligations such as the payment of income and other taxes. Failure to collect taxes from those best able to pay places an unfair burden upon the remainder of the community. If the standard of living in Iran is to be raised, the administration of the tax laws must be reformed.

It is not surprising that, in view of the unfamiliarity of wealthy Iranians with modern industrial enterprise, the Government has felt impelled to establish its own industrial plants, to develop mines, and to construct the railroad system. The progress made prior to the war probably would not have been possible if the country had waited for private investors to risk their capital in new enterprises. But profitable operation of industries by Government, particularly of those which must compete with privately-owned businesses at home and with efficiently-produced products from abroad, is very rare. Examples of this are to be found wherever Governments have engaged in business. Even in the operation of monopolies such as railroads, power plants, and telegraph and telephone systems, Government management the world over has proved to be wasteful and inefficient. Beset by political expediency and without the competitive urge to produce high quality at low cost, there is little incentive for management to use its initiative, to eliminate useless expense, and to maintain plants in efficient operating condition. One of our strongest recommendations, stated later in this report, is that the Iranian Government adopt as its long-term policy the transfer of its industrial enterprises and mines to private ownership. Fundamentally, the profit motive must be present if efficiency and quality of management and production are to be achieved.

In discharging the duty undertaken for the Government of Iran, we have taken the position that our study and recommendations concerning the Seven Year Plan should embrace those aspects of the national economy which materially affect, or will be materially affected by, this Plan of social and economic improvement. Whatever the language of the agreement under which this work was undertaken, such an understanding must be regarded as implicit in our mandate. The controlling objective of our study is to contribute to the success of the Seven Year Plan.

This does not mean that all the factors which enter the general problem have been examined with equal thoroughness or that our recommendations provide answers to all questions or even to all the vitally important questions which have arisen. Practical considerations put a limit to what can be done in such a study as we have just completed.

The point we wish to make here is that the successful achievement of the Seven Year Plan objectives, viewed broadly, involves much more than the preparation of technical specifications for certain projects which must be executed during the course of the program. As a matter of practical procedure, the analysis of conditions to determine what these projects are, their interrelationships and the priority in which they should be undertaken occupied much of the time available for field study, and the presentation of our findings concerning them occupies much of the volume of our report. This is necessary to provide an adequate and trustworthy foundation upon which many other considerations can rest. It is only when we can see what physical works will be required in order to change the social and economic life of Iran in the direction sought that we can effectively analyze the collateral problems of finance, organization, personnel training, labor availability, general economic readjustment, and many others which are equally a part of Iran's total problem. And it is only as these can be studied and progressively oriented toward the common objective that we can indicate what deeper reforms, many necessarily of an evolutionary character, must be set in motion in order to make possible the realization of the longer-range aims of the Seven Year Plan.

In this report, consequently, we have described frankly and in considerable detail conditions as they appeared to us during the course of our field examination and the measures which we believe should be taken toward their improvement. In many cases, these measures have been described precisely in terms of actions which can be taken at once or in a particular sequence which has been indicated. In other cases, the appropriate action is to continue with investigations upon which a final decision can be based; in others, it is recommended that no action at all be taken until some future time.

To execute the projects comprising the program of works just mentioned requires that suitable agencies exist, that their functions and procedures be defined, and that their performance be directed in such a way that the projected works will be executed in fact. Our recommendations for the creation and direction of new agencies, and concerning their relationship to existing agencies, have of course been guided by the provisions of the Seven Year Plan Act. Where the detail of these legal provisions has seemed to us to be unsuitable to effective accomplishment of Plan purposes, however, we have departed from the strict letter of the law and have recommended that certain changes be made in it to permit efficient administration of the Plan.

There is attached hereto as Exhibit 2 an English translation of the Seven Year Development Plan Act dated 26 Bahman 1327, furnished us through the courtesy of the Iranian Embassy in Washington, which we have used as our official copy. In developing the program submitted in this report we have, in general, followed the Seven Year Plan as outlined in the law. We have, however, in accordance with our contract, departed somewhat from the exact allocation of funds by categories contained in the law. In view of the practical difficulties involved, we have not definitely allocated funds by ostans. We have, however, throughout our study given consideration to this requirement of the law.

In arriving at our allocation of funds, we have estimated the cost of individual projects to the extent that available information and time permitted and then allocated the allowance for each project to the last six months of the year 1328, the year 1329, and the remaining five and one-half years of the Plan. There is attached hereto as Exhibit 3 a statement showing these allocations. It will be noted that allocations for the last half of the year 1328 and the year 1329 exceed expenditures contemplated under the law for these periods, although total recommended allocations conform with such contemplated expenditures. Actually, expenditures under our program should be no greater than those stipulated in the Act, as many of the individual projects allocated to the first 18 months probably cannot be started within that time, due to circumstances surrounding the particular project which are not now foreseeable.

Throughout this report, in calculating rial requirements for foreign exchange, we have used the rates of Rls. 32.5 to the dollar and Rls. 130 to the pound sterling.

The allocations summarized in Exhibit 3 were made to conform with the law and to establish an order of priority, although the periods selected are exactly one year later than those specified in the law. We do not expect that expenditures will be made in accordance with these allocations, but that they will be constantly controlled in the light of conditions as they develop. This is essential to the success of the Plan. As pointed out in the economic section of this report, the rate at which the plan can be carried out depends on the availability of funds and on how rapidly these funds can be spent without an unduly severe impact on the national economy.

We have based the recommendations and the estimates in our report on a "peace" economy. We have done this not only because any plan of this nature must assume that international peace will be maintained, but also because we believe that much of the military equipment which Iran may require for legitimate defense can better be obtained from abroad than by distorting the national economy in the effort to achieve military self-sufficiency. Hence, our recommendations with respect to industrial development, transportation and communications have been based upon economic rather than strategic considerations. We believe that this is sound procedure as we are confident that Iran's best defense lies in the development of a sound economy and the raising of the standard of living of its people, which will help to insure domestic stability and international respect.

The selection and description of particular projects which should be undertaken and the initial establishment of new agencies and other organizations which must be provided in order to execute those projects is only the first step towards accomplishing the purposes of the Seven Year Plan. However important, this represents only a static aspect of the Plan. It can be compared to the detailed blueprint from which an intricate mechanism, such as a modern airplane, can be assembled by giving painstaking attention to its directions. The dynamic aspect of the program introduces problems of a different character, which cannot be shown on the blueprint. The aircraft must be flown under rapidly changing conditions, any one of which, if not met with requisite skill, will deflect and might destroy it. The mechanism of a national economy is much more involved and the hazards of unskilled alteration much greater.

At this point, where the new organization goes into operation to produce in the living economy of the country the social and economic effects at which the Plan blueprint is aimed, our report ceases to be a guide in the same sense that it can be so considered in the program-forming stage. The day-to-day direction of the Seven Year Plan must depend ultimately upon the skill, experience and judgment of those whose hands are on the controls. While no two problems may ever present themselves in precisely the same terms, experience evolves a pattern of action and a maturity of judgment which instinctively draws back from the repetition of errors and recalls the lessons learned, sometimes at great cost, in similar circumstances.

Steps can be taken, nevertheless, which will fortify a beginning administration to meet new problems. One of these is to supplement the regular personnel with selected assistants, probably from foreign sources, who have gained their specialized experience—and paid its price—in years of work elsewhere. Another one is to engage consultants on the higher levels to assist in general direction or where judgment and experience must be combined with highly specialized knowledge. Another way is to make full use of competent contractors for the execution of certain segments of the program for which the contractors can safely be entrusted with almost complete responsibility. Another way is to induce well-qualified foreign private companies to participate in certain types of economic operations, bringing with them both the technical and the managing skills which are required. Finally, the manner in which the administrative and executive organization itself is put together, its functions, responsibilities and authority defined, and its personnel selected, will have profound influence on the way it operates and the success with which it meets its constantly changing problems.

Each one of the foregoing devices for assuring sound continuing management of the Seven Year Plan is discussed elsewhere in this report. Most of these subjects are dealt with in the section on organization (Vol. V). There, however, the discussion is aimed primarily at explaining why the various agencies and procedures were recommended in the particular form which appears. Thus, in the field of agriculture, the functions essential to plant and animal improvement are considered and provisions made for dealing with each important aspect. Similar expositions will be found in connection with the textile industry, the development of electric power, etc.

These intensive analyses lead to fairly precise definitions of many important functions and to certain types of agencies which must be provided for their execution. To make clear why we have included certain projects in our recommended program of works and excluded or deferred others, and devised an organization and method of administrative control to suit this particular type of program, it is necessary to consider certain principles which, in our opinion, must have a controlling weight in determining the course of the Seven Year Plan. These principles will have to be applied continuously by those responsible for directing the Plan operations, just as they have been applied initially in selecting the projects and devising the organization recommended here.

What will be the outcome of their composite application in any particular case cannot be told in advance, for the surrounding circumstances will be constantly under change.

National Development Effort Must First be Applied Near the Bottom

It can be expected that the frequent repetition of this simple fact throughout our report will be received with impatience by many of those who are responsible for executing the Seven Year Plan. It remains, nevertheless, the sole point of departure from which a sound program can be launched.

The effort itself, of course, must come first from the top, which is the source of guidance and means. It must be applied first, however, close enough to the social and economic foundations of the nation to stimulate a healthy growth at the lowest level. Unless this can be done, no subsequent efforts can be relied upon to produce lasting benefits.

This does not mean that a long period of plodding progress must be envisaged before the general rise in social and economic standards of the country reaches a point which warrants attention to more advanced practices. Not at all. Progress and improvement should take place continuously at every level. It does mean, however, that labor, which is the basic source of every country's prosperity, cannot meet the requirements which will be made upon it from higher levels unless it is well nourished, well housed, well clothed, healthy, and properly trained. It means also that unless the men and women who contribute this labor are persuaded that their own efforts in these new directions will produce prompt, tangible, and continuous improvements in their conditions of daily life, these new efforts will not be made. At any particular stage in social advancement, it is less the actual evel of living standards which determines the spirit and vigor of the people than it is the knowledge that their conditions are continuously improving and that increased or better-guided effort on their own part will accelerate that improvement.

To bring about the conditions just indicated requires, among other things, that attention be given to increasing and improving agricultural production and to the services, such as transportation and disposal of products, which are necessarily involved. Such improved and increased agricultural production, moreover, not only vitalizes the labor of the country in the ways mentioned, but it provides surpluses for exchange which swell the purchasing power of the people, thus enabling new markets to be created which, in turn, lead to new opportunities for manufacturing and trade.

This, in barest outline, is the necessary sequence of development. In Iran, where much progress has already been made, advancement can and should continue from each present level in each field, provided only that in each case the essential elements of success have been provided in its foundation. It must be noted, however, that in many instances the failure of such undertakings in Iran's recent history has been due precisely to the failure to provide a sound foundation. No new industry is likely to flourish under conditions of ill-nourished, ill-housed, ill-trained labor supplied by people indifferent to the outcome and, in any case, without the purchasing power to buy the new products.

It is with the foregoing ideas in mind that we have planned our recommended program. We are aware that many other factors must come into account, but we are convinced that a much stronger foundation must be laid than exists today before any semblance of a modern economy can be produced or supported by the people of the country. Therefore, despite political exigencies and anticipations of special interests, we place our first emphasis upon the necessity for prompt and increasing improvement in the conditions which directly control the vigor and productiveness of the population.

So that the ideas just discussed will not be passed over as mere moralizing on a well-worn subject, we wish to give pertinence to what we have just said by pointing to a few particular cases.

One example is the proposal to build a steel plant near Tehran immediately, still considered valid for the purposes of the Seven Year Plan by some, as evidenced by its inclusion as one of the projects noted in the Act. The type of reasoning which appears to justify such a utilization of money, effort, and skill, out of the limited supplies available, for the erection and operation of a steel mill under conditions now prevailing in Iran, is not a type of reasoning which, in our opinion, will lead to the success of the Seven Year Plan. Obviously, those who continue to support such a project are thinking along different lines from ours. Even if successful in its technical operations, which by no means can be taken for granted with conditions as they are, the production from a heavy industry of this type would provide almost none of the remedies which the country's ills require today or in the near future. Moreover, the drain on the country's resources in capital, skill, and services might seriously cripple other efforts aimed at meeting practical needs.

Launching a full-scale drilling program in a "wildcat" search for oil before the necessary preparatory work has been done would be similarly a case of misdirected and untimely effort.

Again, limited public funds and administrative skill must not be drawn upon to build and operate a factory for nitrogenous fertilizers until it can be shown that this is the next step necessary to increase or improve agricultural production, and that the benefits obtained will be sufficient to justify their cost in comparison with other ways of utilizing the money and of securing the same benefits.

The technique through which these and other questions of priority or economic soundness can be analyzed is discussed elsewhere in this report. Here we aim only to make clear that Iran's social and economic development must be built soundly from the bottom. Even with the highest priority such progress will be slow. Meanwhile, but never at the sacrifice of more fundamental needs, public resources can be used to accelerate and expand the production of needed goods and services at every level, consistent with the increasing capacity of labor to produce and of consumers to purchase. The requirement that the foundation be soundly built does not necessarily interfere with active work on higher levels.

Capital is not a Substitute For Skill or Experience

Capital can be utilized effectively as a means of producing new wealth or providing essential social needs only when its use is directed with skill and experience. Otherwise much of it simply disappears as waste in one form or another. Skill and experience, generally speaking, are likely to be recognized and properly appraised only by those who possess them. By others their value is very likely to be underrated or overlooked, and the power of capital alone to achieve desired aims likely to be greatly exaggerated.

One very real limitation, therefore, upon the rate at which Iran's economic program can progress will be the rate at which the necessary skills and experience can be acquired where they are now lacking. We use the term skill and experience here to embrace all the special capacities for doing the different kinds of work which are required in executing the Plan program, from the manual skill of the artisan to the trained judgment of the executive who creates and directs an entire organization.

Obviously these capacities exist only in isolated cases in Iran today, since in general the practices which require them also provide the only means of developing them, and most of the practices which concern us now are still to be introduced to Iran. How the requisite skills can be developed most effectively, and how deficiencies can be made up by using foreign specialists and consultants, are dealt with elsewhere in this report.

Here our intention is to make clear that it is not only wasteful from the standpoint of using money, but futile from the standpoint of achieving results, to press any undertaking ahead faster than all the skills which are essential to its success are provided for. They may be provided in various ways. By and large, however, there is no substitute for knowing how to do a piece of work.

This necessity for special knowledge or skill exists throughout the program of the Seven Year Plan. In deciding the sequence of projects and the rate at which they can be executed, the need for special skills must be foreseen and the schedule kept within these limits. In the case of a factory, for example, if Plan funds are to be employed, the skills required for the economic studies, design, construction, operation, management, and marketing of products must all be foreseen and provided; otherwise, the factory will fail of its purpose regardless of the capital available to pay its cost.

Co-ordination is an Essential Ingredient of the Plan

We have emphasized our belief that a rising national prosperity can rest only upon continuously improving conditions among those who furnish the labor for national production and become, at the same time, the consumers of the multiplying goods and services. To bring about those changed conditions, and to take full advantage of the resultant continuing opportunity for advancement, we emphasized that new skills must be developed or engaged in order that capital may be used effectively in producing new wealth for distribution among those contributing to its production.

The number of factors that are involved in applying these two principles is great. Characteristically, these factors are not independent of each other but are closely related, a change in one affecting many others. Production in almost any field is affected by the health, skill and interest of the workers. The value of increased production depends upon the uses to which it is put, its availability when and where there is a demand for it, and the price at which it is bought and sold. These things depend upon the availability of money for investment and trade which, in turn, are affected by laws, tax systems, and established customs. Each of these aspects of national life and many more affect and are affected by each of the others.

In Iran the social and economic changes now proposed will necessitate vital readjustments throughout this complex national organism. A long-established relationship between a community and its surroundings can be completely changed by a road or a power line touching it for the first time, or the building of a nearby factory or the introduction of a new crop. The Seven Year Plan, in its entirety, will affect every community in the country, and not only in one of the ways just suggested, but perhaps in all of these and many more. The futility of treating any single project in isolation from all the rest when appraising its effect is apparent—even though for practical reasons it must be regarded as a separate activity for the purpose of getting it done.

The responsibilities assumed by those who direct the details of such a program are serious ones. Each important undertaking must be envisaged with all its consequences, and provisions made to deal with new conditions created which, without still other new conditions to go with them, would leave the total situation no better than before.

This requirement will tend to determine the pattern of Plan operations as a widening system of separate and locally developing areas, within each of which, perhaps around some project of major importance, other dependent or closely related works are performed. Such co-ordination will tend to produce a new equilibrium on the new level of activity, with the necessary adjustments made possible by well-planned basic provisions.

A new sugar factory, for example, well located as far as factors essential to that industry are concerned, might provide the nucleus around which many projects could be formed. Some, indeed, would be mandatory for technical or economic reasons, including beet cultivation, irrigation, malarial control, roads and new community services. These, in turn, would invite supplementary or related enterprises, private and Government, including vocational training, commercial enterprises, improvements in food production and general sanitation, all tending toward a balanced community or regional life.

Co-ordination, as we use the term here, does not mean regimentation or excessive planning of details. It means envisaging the kinds of things which must be done together if they are to be done at all, and at the correct time taking such steps as are appropriate. To put it another way, it means not to put a sugar factory in one locality, build a transportation system to another, eradicate malaria in a third, and develop an irrigation system somewhere else, all to serve some political purpose or no purpose at all.

Co-ordination, as we mean it, requires a high sensitivity to the effects which will be produced by any substantial change in the vital social or economic conditions of the country. This includes the changes which must be undergone by the people themselves, particularly when long-established customs are involved, and the rate at which such changes can be brought about in different circumstances. It includes also the far-reaching changes which might result from unbalancing the supply of money in relation to the supply of goods and services available for exchange. It includes the effects of new demands for labor, and of migrations induced by regional developments. In the field of physical operations in connection with new works, both public and private, it includes attention to the balancing of requirements and availability of labor of all classes, national and foreign funds and transport facilities.

Of the three principles which we have chosen to emphasize in this introduction, in explanation of the main lines which our conclusions and recommendations have taken, the first, "National effort toward social and economic advancement must be applied first to fundamentals", is reflected in the priority we have given to certain types of activity in our recommended program. If similar criteria continue to be observed during the progress of the program, this principle is simple to apply.

The second principle, "Capital is not a substitute for skill and experience", is reflected in the provisions we have recommended for training Iranians, for employing aliens with specialized qualifications, for using experienced contractors and, in a much broader way, in our recommendations for establishing and administering an organization under the Managing Director and High Council. The foregoing provisions, however, are of the type we referred to earlier as "blue print" instructions. They can do no more than guide the initial establishment of an organization and definition of functions. To provide the special skill and experience which will be needed on the highest level when the Plan goes into operation, we have proposed a consulting service closely and constantly available to the top management of the Plan. These provisions should assure adequate attention to the need for skill in addition to capital.

The third principle, "Co-ordination is an essential ingredient of the Plan", cannot be represented in any "blue print". The factors involved are inherently dynamic and it is their changing character that presents the problem. It is our opinion that of all the problems indicated as important in the foregoing discussion, it is the wisdom with which all Plan components are co-ordinated, in the sense discussed earlier, that will control the degree of success of the Plan. Individual projects, whatever their nature or difficulty, can be executed successfully by qualified persons, and these are always available somewhere. Any number of such individual projects can be executed if money be available to pay the cost.

How all these separate undertakings will interact upon each other and upon the people of the country, however, and how these interactions will affect the initial outputs or results, thus bringing about still more complex consequences, cannot be mapped in advance.

Those upon whom Iran depends for co-ordination of this involved program must select what basic landmarks can be found, and let their wisdom guide them. In that direction this report can go no further.

SUMMARIES

Following hereafter are summaries of the sections of the full report covering the specific subjects studied. In Volumes II through V these subjects are discussed in detail.

PUBLIC HEALTH

The full report on public health in Volume II reviews the present situation and recommends a specific program for the Seven Year Plan.

PRESENT HEALTH CONDITIONS

The death rate for the nation is not known, much less the death rate from specific diseases. The only source of morbidity data is the Governmental treatment program, carried out in 115 hospitals and 350 polyclinics. From their reports and from the judgment of physicians, we can make only approximate estimates of the extent and distribution of various diseases.

Among the insect-borne diseases, malaria, with an estimated 3 million to 5 million cases annually, is the principal national health problem. Typhus fever epidemics are common and leishmaniasis is widespread.

Among diseases preventable through general sanitation, diarrhea is an important cause of the high infant death rate, which is estimated at over 500 per 1,000 live births. Ascariasis, typhoid fever, paratyphoid fever, the dysenteries, and food infections are widespread. Anthrax, brucellosis, bovine tuberculosis and tapeworm infections are problems of importance.

Trachoma, tuberculosis, and the venereal diseases may be grouped with malaria and the intestinal diseases as the foremost national health problems. Pediculosis, scabies and fungus diseases of the scalp are widespread. The common infectious diseases of children are generally distributed throughout the country, and there are at least 7,000 cases of leprosy.

Those diseases which are preventable through immunization (smallpox, typhoid fever, typhus fever, diphtheria, scarlet fever, whooping cough and tetanus) are also common and widespread. The absence of obstetrical and midwifery service in most of the country results in many maternal deaths from puerperal infections and from hemorrhage, and in deaths among the newborn.

We are without data on non-communicable diseases such as cancer, diseases of the heart and blood vessels, diabetes and nephritis. All of the dietary deficiency diseases are to be found in Iran, but their extent is unknown, as is also the extent of mental diseases and dental ailments. It is estimated that there are over 1,000,000 opium addicts.

There is no adequate program of insect control, and cities and towns are still without sanitary water supplies and without sewerage systems. Ice is made in the cities from polluted water and distributed without adequate sanitary precautions. The spread of disease through milk is restricted only by the general custom of using boiled and soured milk. Food is neither dispensed nor kept under sanitary conditions. Housing for the poor is crowded, inadequate, and unsanitary, and village baths spread infections. Industrial sanitation varies widely in quality, and school sanitation is generally inadequate.

PRESENT HEALTH ACTIVITIES

The seriousness of the public health problem in Iran has been recognized; the Ministry of Health, the Ministry of Education, the military establishments, the railroad, the Agricultural Institute and many voluntary organizations have public health programs.

The Ministry of Health is primarily a treatment agency, operating 115 hospitals and 350 polyclinics, and spending only 5 to 10 per cent of its budget on public health activities. It employs about 4,700 persons, but none within its employ has had public health training. The health officers and other medical employees are trained only in clinical medicine. There are no formally trained public health nurses, public health engineers, sanitarians, health educators, vital statisticians, nutritionists, or laboratory technicians. Its only public health activities include the preparation of vaccines, the carrying out of a limited vaccination program, the operation of quarantine, and the emergency control of local epidemics. In this connection it collects statistics from its health stations concerning the prevalence of communicable diseases.

A law creating the Ministry establishes various subdivisions within the technical division, such as vital statistics, hospitals, communicable diseases, local health administration, maternal and child health, health education, the supervision of medical practice, food and drug control, research and planning. The Director of the Technical Division assigns men to these special problems. He refers technical questions to them, but they have no responsibilities for the national program in these fields. It should be kept in mind that the health program is highly centralized at the national level, that there are very few health activities supported at the local level, and that the rural areas are almost completely without health service.

The salary scale in the Ministry of Health is stated to be much lower than those for comparable services in other divisions of the Government or in voluntary health agencies. Both medical and non-medical employees throughout the country almost always have some other employment or source of income in addition to their public health jobs.

The budget is not organized by public health activities. Expenditures are mainly for salaries and hospital maintenance, and the only classifications published are for "miscellaneous and travel", "administrative expense", "technical costs", "drugs", "food", and "general and provincial expenses".

The Ministry of Education operates some 2,900 public schools in the 40,000 cities, towns and villages. It employs 28 physicians, 9 assistant doctors, and 4 dentists; all are located in cities. There is no national supervision of school medical service or of school sanitation. There is very little physical education, and only a small amount of factual instruction in health, usually carried out by the science or biology teachers.

The military establishments have their own medical services for the care of personnel. The Army Medical Corps examines and vaccinates recruits and carries on a limited amount of instruction in health as a part of its literacy and education program. It has co-operated effectively in public health wherever opportunity has offered.

The Iranian State Railways maintains its own medical and hospital services.

The Agricultural Institute prepares vaccine for the prevention of animal diseases and supplements the work of the Pasteur Institute in the Ministry of Health in providing biologicals for public health use.

Voluntary health agencies include the Imperial Social Service Organization; the Red Lion and Sun; and special groups concerned with tuberculosis, venereal diseases, and with combating the use of opium and alcohol. There are also three foundations and various professional associations.

The Imperial Organization for Social Service has a budget of nearly Rls. 100,000,000 a year and operates a vigorous, well administered program. It prefers to restrict its work to medical care, but it is carrying on some prophylaxis at present because so little is being done in that field elsewhere. Among its other activities are development of dispensaries in rural areas, development of a school of nursing, provision of facilities for the treatment of accidents and emergencies in Tehran, development of maternity and child health care in Tehran, the operation of a technical school for training skilled workers, and the operation of a work center for beggars and vagabonds. It has special projects for the control and prevention of malaria, and has rendered other special treatments and services to the poor in special situations.

The Red Lion and Sun, a twenty-five year old charitable activity recently reorganized, is well administered and expanding rapidly. Its program is in general similar to that of the Red Cross in other countries.

The Society for the Prevention of Tuberculosis is a new organization which hopes to increase hospital and sanitarium facilities, to train experts, and carry on health education.

The Society for the Prevention of Venereal Disease is a recently organized group which collects information on this subject, operates a clinic in Tehran, supplies some drugs to the Ministry of Health, and hopes to expand its services leading to the improvement of treatment and preventive services.

The League against Opium and Alcohol has made a study of these problems. It treats opium addicts, and is concerned with the reduction of both opium and alcohol addiction.

There are a well-organized medical society and associations of dentists, midwives, and pharmacists.

The Near East Foundation has developed a splendid program of rural betterment including rural sanitation, malaria prevention, and health improvement in the Veramin villages near Tehran. The Iran Foundation is planning the construction and operation of a model hospital in Shiraz and is already making other contributions to the public health. The Rockefeller Foundation now has a resident public health specialist in Iran and is interested in a demonstration of local health administration and the training of public health nurses and workers.

PROPOSED PUBLIC HEALTH PROGRAM

The public health activities which we propose are based upon a careful study of the present activities of the Ministry of Health, extensive field visits from the Caspian Sea to the Persian Gulf, many conferences with medical and health personnel, and a careful study of the suggestions of the Health Advisory Committee to the Provisional Planning Board, which were prepared before our representatives had reached Iran. Our recommended program was agreed to in principle in a four-day conference with representatives of all the national health agencies of Iran, both official (civilian and military) and voluntary.

It was agreed by this group, with the cordial accord of the Ministry of Health, that the activities should be administered by the Seven Year Plan and later turned over to the Ministry of Health, mainly because there is very little public health work done by the present Ministry of Health and the proposed activities are mostly new. However, widespread immunization and malaria control were proposed for inclusion in the Plan program, although activities in both of these fields have been begun by the Ministry of Health. Technical personnel should be borrowed by the Plan Organization from any of the other Government departments.

There are certain bases for the selection of public health activities:

> The law restricts this program to disease prevention. Thus, the Plan cannot expand services in curative medicine, although such expansion is needed.
>
> The training of personnel must also be restricted to public health training, except where basic training must be given in order to secure public health workers.
>
> Special consideration must be given to the other activities of the Seven Year Plan. Care must be taken to see that new industrial and agricultural projects in special areas do not fail because the health of the people is neglected. Advantage must be taken of improvements in highways, communications, education, and other factors by locating health programs and health centers where they can function best.
>
> Those activities must be selected which will produce definite and prompt improvement in public health. Money must not be spent upon buildings except where they are absolutely necessary. Attack must be made on specific diseases where the most rapid and satisfactory progress can be made.

Certain urgent needs are apparent. Public health personnel must be trained. Expert and experienced public health leadership and supervision must be provided if the program is to succeed. Malaria can and must be sharply reduced. Smallpox vaccination and immunization against certain other diseases can and should be rapidly extended. General sanitation must be improved. Steps must be taken toward an immediate reduction of the very high maternal and infant death rate. Trachoma, syphilis, and tuberculosis are of such importance that programs must be launched against these diseases to the extent possible. Health education of the public must accompany such a program. To facilitate and consolidate these and other activities, public health services must be developed in areas now without such services.

In the development of this program, co-operation with other agencies will be important. The co-ordination of public health activities inside the country can be secured by the extension of the kind of joint planning begun in the four-day conference mentioned above. Through continuing contact with the World Health Organization and other international agencies, Iran can secure such contributions to the health program which these agencies are in a position to make.

The setting of a fixed and detailed plan for seven years is obviously impossible. Therefore, provision must be made for flexibility and redistribution of activities and funds as the program progresses.

The full report sets up detailed plans for the recommended program, which may be summarized as follows:

Providing Trained Personnel and Supervision

The public health program cannot succeed without personnel adequately trained in public health, working under skilled leadership and adequate supervision. Physicians need special training if they are to leave clinical medicine and go into public health work. Trained public health engineers, sanitarians, laboratory workers, health educators and other public health specialists are needed. We recommend the appointment of foreign experts to inaugurate the program and to train Iranians in the work. It will be desirable that the administration of the program be taken over by Iranians as soon as may be practicable.

Public health training should be provided by sending outstanding Iranians to foreign schools of public health to be trained in the various special fields. Provision should be made for training various groups of workers in public health. Doctors must be educated as rural health officers, midwives must be trained to teach rural midwives and to promote hygienic living and nurses must be trained for rural health work. Laboratory technicians in public health and young men trained in general sanitation and vaccination will be needed.

Communicable Disease Control

It is appropriate that the Plan should take over current beginnings in malaria control because it is the only agency with an adequate budget to carry out this much-needed program. The spraying of houses and barns with DDT, plus the use of supplemental but less important measures, can reduce the incidence of this disease sharply and promptly. The program should be expanded to national scope as rapidly as trained personnel and facilities become available. Since DDT is also effective against the sandfly and the housefly, it will contribute toward a reduction in the incidence of "tropical sore", trachoma, and infant diarrhea.

Through the production of vaccines and the employment of vaccinators, immunization against smallpox and typhoid fever can be promptly and rapidly extended. This program, like malaria control, can bring prompt and significant results which can be understood and appreciated by the people. Immunization against diphtheria, whooping cough and tetanus should be extended as rapidly as possible.

Eventually western standards of obstetrical and infant care with prenatal clinics, ostnatal care, and baby clinics can be anticipated, but the development of this program ust necessarily be slow. The important immediate problem is to raise the level of mid- ifery service at least to the point where maternal and infant infection can be sharply educed. First steps are, therefore, directed toward the basic widespread improvement in idwifery service through instructing the present untrained midwives and adding new ecruits.

The incidence of trachoma was reduced in certain population groups in the United tates in the four years from 1316 to 1320 (1937 to 1941), from 26.6 per cent to 3.6 per cent hrough the use of sulfanilamide. Experimentation should be undertaken as to its ffectiveness in Iran and the program of eradicating trachoma expanded as rapidly as racticable.

The extent of tuberculosis and its apparent increase in urban areas make it desirable o secure more exact information concerning its incidence, and to develop demonstration rograms in case finding and control, even though a complete prevention program could ot be undertaken within the resources of the Seven Year Plan. We propose, therefore, at a survey be made during the second year of the Plan, to develop a few demonstra- on programs, and to extend the fight against the disease as far as resources will permit. sufficient evidence of the efficacy of Bacillus Calmette-Guerin vaccination should be pro- uced, this procedure may be used.

The Plan Organization should undertake a study of syphilis, develop model enereal disease programs in at least a few localities, extend such programs as widely as rcumstances permit, carry on an educational campaign, and supply drugs for rapid eatment in situations which will markedly contribute to the public health. It is particu- rly important to detect syphilis in expectant mothers and to treat them in order to revent congenital syphilis in their children.

itation

Safe water supplies are of primary importance and the Plan expects to assist in the ilding of water supply systems in many of the cities and towns. Plans are made for the provement of general sanitation in food control, waste disposal, and housing in both ban and rural areas.

The sanitary engineering staff should contribute to the sanitation of new industries hich are to be established and to the improvement of industrial sanitation and working nditions in existing industries.

Sanitarians and health educators should advise concerning improvement of sani- tion and health education in schools. Medical service should be provided for children rural schools where rural health centers are able to offer this service.

ealth Education

The individual can avoid communicable disease when he knows how it is transmitted. t is difficult to make an area sanitary where people are uninterested in or ignorant of anitary measures. Public health education is of primary importance for the promotion of maternal and infant health and for control of disease. An extensive health program is therefore recommended to educate the people through various publicity media, the schools, and the Army in such a way as to interest them in general hygiene.

Health education in the interest of dental hygiene should be carried forward and, beginning with the second year, surveys to determine the incidence of dental caries, malocclusion, and gingivitis should be undertaken in typical cities.

Rural Health Service

It is desirable to extend health services as rapidly as possible to those people who now receive none. It cannot be done more rapidly than public health personnel can be trained. Doctors and nurses without public health training and without supervision would merely establish local polyclinics, like the present unsatisfactory treatment centers.

Experience with the first centers should serve as a guide for future plans, type of operation and the size area best served. They must be located strategically with respect to other activities of the Seven Year Plan. To locate them in advance at fixed points would be impracticable.

With these facts in mind, plans are recommended to establish as many rural health centers during the first year as can be supplied with trained personnel, and to increase the number of these rural health stations or health centers as rapidly as is practicable.

Other Projects

We suggest the establishment of a National Health Institute in Tehran to be combined with the present activities of the Pasteur Institute. It would provide a research center for investigation of public health problems, facilities for training workers in public health, and a laboratory for the standardization of public health laboratory procedures with special reference to the testing of food and drugs.

The lack of public health laboratories is a serious obstacle. One or more adequate public health laboratories in each ostan should be equipped and staffed.

The Plan should furnish drugs to be used in the curing of opium addicts and carry on education against the use of both opium and alcohol.

Facilities should be provided for the maintenance of adequate quarantine services covering air, rail, automobile, and water travel on the basis of a survey to determine the extent to which international travel uses particular ports of exit and entry.

During the third and fourth year of the Plan a nutrition survey is proposed to determine the diets of typical groups and the kinds and frequency of nutritional diseases. Such studies are needed as the basis for improvement in national nutrition.

The physical and mental health, and the richness of the life of the nation are widely influenced by recreational opportunities and customs. This applies particularly to recreation in the form of physical activities. In order to lay the ground work for improvement in recreation and sports for the general public, and in physical education for children, a survey of both recreation and physical education is proposed during the later years of the Plan.

Increased information should be sought through the gathering of vital statistics in connection with the proposed national census. The revised international list of causes of disease and deaths should be adopted. Vital statisticians and statistical clerks should be trained and the establishment of registration centers for births and deaths encouraged.

Summary of the recommended allocations of Plan funds for the public health program is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ years	Total
Malaria	22,894	61,170	255,870	339,934
Tuberculosis, syphilis and trachoma	640	6,500	153,250	160,390
Vaccination	11,850	22,300	122,350	156,500
Rural health centers	10,000	40,000	255,000	305,000
Other projects	30,113	75,833	435,361	541,307
Total	75,497	205,803	1,221,831	1,503,131
Portion of above required for foreign exchange	19,546	29,442	92,114	141,102

EDUCATION

On the assumption that the basic educational objective of the Seven Year Plan was the mobilization of the entire resources of the nation, including its manpower skills and potentials, for the purpose of developing the national economy and raising the standard of living, we came to the conclusion that the educational expenditures should be restricted to projects which, while meeting the needs of the immediate moment, would also be consistent with a co-ordinated long-range program involving the use of all pertinent educational facilities to raise the level of national well being.

Such a basic assumption demanded a much more extensive and at the same time intensive study of the existing educational system than had originally been contemplated by the Provisional Planning Board. A sampling technique of study was adopted and we surveyed 190 schools of different types in 40 cities and towns and 14 villages scattered throughout Iran. In addition we interviewed outstanding educational and lay leaders and made a detailed survey of the existing technical literature dealing with the problem.

The overwhelming conclusion which has come from this investigation of the educational structure of Iran is that the basic point of failure has been its educational philosophy. We feel that the existing school system has accomplished with relative success the aims which consciously or unconsciously motivated its founders three-quarters of a century ago—that of producing a distinguished intellectual elite, and of establishing an instrument by which the thoughts and actions of the common people might be efficiently guided. It is therefore not so much a technical failure of the schools as a changed social philosophy which makes the existing system anachronistic and unsatisfactory.

The educational philosophy, and the technical details of the school system, are largely a copy of the traditional French system—characterized by extreme centralization of administration, authoritarian methodology, theoretical rather than practical studies, stereotyped and overloaded curricula, and a policy of eliminating rather than salvaging students who do not meet the arbitrary and rather artificial standards of academic excellency. We are of the opinion that Iran must adopt a new educational philosophy which in general rejects these characteristics and seeks to produce a trained and responsible leadership, develop free and original research, and promote the growth of a skilled, informed, and self-reliant citizenry. We feel that a decentralized system with an emphasis upon democratic rather than authoritarian methods and with a much expanded, practical, and relatively elective curriculum offers the greatest hope for basic reform. We recommend that no system be slavishly copied, but that the model of the Anglo-Saxon decentralized system be thoughtfully studied and its best points adapted to the Iranian scene.

In studying the educational system we attempted to discover not only the internal technical operation but also those points where external influences such as the sociology, the religion, the economy, the politics, and the history of Iran impinged on the educational problem. As a convenient method of analysis, we divided the educational system into thirteen areas: attitudes and psychological patterns, administration, schools, curricula, methodology, textbooks and teaching materials, teachers, students, guidance, supervision, laws, finances and construction.

As a result of our detailed study in each of these areas we came to the conclusion that, while the existing Iranian educational system offers very little of a technical nature which is worthy of retention, the mass of Iranian people themselves offer the greatest hope for a fundamental reform. Thus we found that the people have at least five outstanding educational assets—a high tradition of culture, a developed craftsmanship, a great appreciation of beauty, a high natural intelligence, and an intellectual inquisitiveness. As opposed to these desirable characteristics, we found that there were certain undesirable ones. Basing our judgment upon the self-criticism of distinguished Iranian educators and scholars, we felt that weaknesses exist in standards of public honesty, in tendencies to seek an excuse or scapegoat, in preoccupation with short range plans and exorbitant profits, in depreciation of physical labor, in lack of personal initiative and dependence on the Government, in an extreme social stratification, and in uncritical acceptance of foreign social patterns.

We found that the administration of the schools was highly centralized, bureaucratic, inefficient both from an economic and from an educational point of view, and that the concentration of power in the Ministry of Education had tended to produce a stereotyped and overstandardized system with little regard for local differences or appeal to local initiative.

Superficially, the school structure of Iran appeared to offer all necessary branches of learning—kindergarten; four and six-year elementary schools; three, five and six-year secondary schools; teacher training schools; technical schools on the elementary, secondary, and higher levels; universities with all the faculties normally found in a European university; night schools and adult education; and mass education media such as radios, motion pictures, the press, and forums. A closer examination of the schools, however, revealed their weaknesses—they were not used to capacity, the instruction in the existing curricula was very poor, and the programs of study bore little relationship to the apparent needs of society. Thus, for example, the majority of the honaristans or secondary level technical schools, although excellently housed and satisfactorily staffed and equipped, were operating at between ten and twenty per cent of their designed capacity and offered programs of study which did not fit the graduates for employment in any of the local industries.

The curricula of all levels of schools have been severely criticized by Iranian educators on the grounds of not offering enough practical work, of being over-standardized, of being overcrowded with subjects, and of not having direct relation to the current needs of society. All of these criticisms appear to be justified, but we would add that the most serious danger is that existing curricula are of the dual type which has been found to be socially disastrous in Europe. They tend to sort out the students on economic and social ounds and to put them into compartments which are ostensibly based on subject matter t which in fact lead inevitably to a predetermined prestige group. Thus, at the end of six rs of common education, the student goes either to the secondary school leading ulti- tely to the economic elite, or to a technical school leading ultimately to the worker class.

The enormous social pressure which exists to pass the examinations and get into one f the favored educational compartments has produced a student body which devotes most its entire time to memorizing the material presented in class and in the textbooks. pon graduation, the elementary school children can read, write and do simple arithmetic; condary school youths have a superficial verbal knowledge of many subjects, but are prepared for any gainful employment; and university students are over-theoretical.

Methodology is verbalistic rather than practical, is authoritarian in the sense that e authenticity of material is seldom questioned, has little laboratory work or practical perience, and makes very little use of library facilities. Textbooks and teaching mate- als below the university level are in general either prepared by the Ministry of Educa- on or sanctioned by it and may be characterized as stereotyped and far removed from the cial needs of Iran. At the university level, the lack of a technical literature in Farsi poses a tremendous handicap necessitating either expensive translations or the use of ference books in a foreign language.

Teachers below the university level are underpaid, poorly prepared, and frequently stracted from their educational tasks by the necessity of earning a part of their living outside employment.

Supervision in Iran is actually inspection to determine the degree of compliance ith official regulations, rather than a co-operative effort on the part of the supervisor d the teacher to improve the quality of instruction. Guidance is virtually unknown, d there is accordingly an enormous educational loss both through lack of accurate nployment counselling and also through an excessively high attrition rate because border- ne cases are not redirected and salvaged.

Educational law is of the statutory type rather than common law, and appears to e satisfactory on technical grounds, although specific legal changes will undobutedly have be made in conformance with the basic reforms. Finances are based on income from e federal budget, from local municipal taxes, from the proceeds of Pious Foundations, d from private sources such as factory owners and landholders. Construction is normally f local materials, and tends to be of standardized types—the six-room, single-floor ele- entary school and the Hekmat-type secondary school. Industrial schools are in general e best housed, but even these suffer from lack of maintenance and poor basic construc- on. A very high percentage of the elementary, secondary, and teacher training schools re rented private buildings inadequate for any desirable program.

On the basis of our detailed investigation of the schools, we came to the conclusion hat these educational deficiencies were symptoms rather than fundamental causes of he educational failure in Iran. They must be corrected, of course, but merely changing etails of the internal operation of the existing schools will not meet the basic need. We eel that there are five fundamental problems which must be solved. How can undesirable ideas and attitudes be changed? How can existing potential manpower be fully mobilized? How can an adequate supply of technically-trained personnel be assured? How can the educational system as an instrument be made more efficient? And how can the immediate educational emergency of the Seven Year Plan be met?

In broad outline we feel that ideas and attitudes may be changed by three methods. One is through fear, as the attitudes of certain wealthy landholders are being modified through fear of social unrest. A second is through force of law. A third is through convincing the individuals that it is to their own self-interest to make the change. But fundamentally there must be a more basic public conscience awakened, a social sense based on something deeper than fear or greed.

Existing manpower may be mobilized by at least eight methods: through greater utilization of the female population in a productive capacity; through efficient utilization of present nomadic populations; through improved efficiency due to public health; through developing new technological attitudes; through improved industrial and vocational guidance; through elimination of certain hampering traditions and superstitions; and through improved technical training to increase the productivity of existing workers.

This latter problem is closely linked with that of providing an adequate supply of skilled labor. This problem is met on two levels: on the training for leadership and on the training of skilled labor. To train leaders, both at the professional and at the foreman level, we feel that at least three methods may be profitably employed: technicians and teachers may be brought to Iran; Iranians may be sent abroad for study; and Iranians may be trained in the schools and factories of Iran. Skilled labor may be trained in industry in some form of an apprenticeship program; may be trained in schools before employment; or may be brought to a higher degree of technical skill through in-service training programs, such as night schools. As a special feature of this more fundamental problem, Iran, during the first years of the Seven Year Plan, will face an immediate emergency need for semi-skilled labor which we feel should be met by short stop-gap trade training courses.

Encompassing all such problems is the vital one of improving the efficiency of the educational system. We feel that this should be done from two points of view: an increased internal or economic efficiency which might be measured by the unit cost of instruction; and an increased external or educational efficiency which must be measured in terms of the adequacy of the training program for the needs of the Iranian society. It is in connection with this latter that we recommend the adoption of a democratic, free, and decentralized system with a broad and diversified curriculum.

In meeting these five basic educational problems, we recommend that eight specific projects be initiated.

The first is an educational research project which should provide basic educational planning for all the programs; conduct a series of educational services, such as curriculum construction, guidance, psychological testing, educational surveys, textbook preparation, and the maintenance of a national roster of scientific personnel; conduct fundamental research on such questions as the writing system, women's education, tribal development, and the legal and financial bases of education; and co-operate in a public information service.

The second is a decentralization and educational development project which should be concerned with the gradual decentralization of administrative control in the educational system and the guidance of technical reform within the schools.

The third is a rural and agricultural education project which should be built around four programs: a four-fold village development program offering anti-illiteracy training, salable handicraft production, public health instruction, and simple agricultural training; a travelling educational mission program ~~in which 25 mobile units would tour village~~

groups offering adult education and ~~stirring up~~ interest in the four programs mentioned above; a rural teacher training ~~school~~ program established in each of the ten ~~ostans~~ to train teachers for the rural schools where agriculture will be a prominent part of the program of studies; and limited participation in the work of higher agricultural institutions.

The fourth is an industrial and vocational education project which in turn should be composed of four programs: the development of a limited stop-gap emergency training plan to supply semi-skilled labor during the first two years of the Plan; the development of a co-operative industrial apprenticeship training plan administered by industrial lay councils and financed by a payroll tax on industry; a limited participation in the work of higher technical training institutions; and the establishment of a training plan for clerical and office personnel.

The fifth is a tribal education project which we feel should be based on the results of the fundamental research program in this area which we have recommended in conjunction with the educational research project.

The sixth is an overseas specialized training project which should provide coordination between the programs of foreign training undertaken by various Plan Organization sections; should conduct a travel service; should assist in educational guidance and admissions to overseas institutions; and should administer and finance the overseas specialized training of educational personnel for the Plan.

The seventh is a teacher training project which should include four programs: an in-service training program required of all teachers in official schools; a series of summer vacation training courses; secondary level teacher training courses including the rural teacher training programs mentioned in connection with the rural and agricultural education project; and participation in strengthening and expanding the Higher Teachers College.

The eighth is an educational incentives project which should consist of a program of prizes and matching funds for the purpose of encouraging increased and systematic local educational expenditures, and of stimulating the development of a higher degree of quality within the existing system.

Because we recognize that the method by which these indicated projects and reforms are carried out will be very nearly as important as the end of initiating them, we recommend that the entire educational participation in the Seven Year Plan be on a democratic and co-operative basis, uniting the efforts of the educational section of the Plan Organization, the Ministry of Education, encouraging the participation of local communities, and drawing upon foreign technical assistance.

Summary of the recommended allocations of Plan funds for the education program is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ years	Total
Administration	13,525	19,025	87,450	120,000
Rural and agricultural	45,200	82,350	272,450	400,000
Industrial and vocational	39,905	51,030	109,065	200,000
Incentives	200	8,300	91,500	100,000
Other	16,504	28,661	134,835	180,000
	115,334	189,366	695,300	1,000,000
Portion of above required for foreign exchange	59,955	71,980	113,765	245,700

AGRICULTURE

The welfare of Iran is intimately connected with the agricultural enterprise of the country. In general, food and housing are meager and the standard of living of farm families is commonly low as a result of using primitive production methods on small land areas. The total potential area for cultivation is large but the cultivable land per agricultural worker is restricted by lack of irrigation to supplement the generally low rainfall. Fortunately, much additional water is available for development.

Rural living centers around a wall-enclosed type of village which is largely self-contained and self-maintained, partly because of limited means of transportation. Absentee landlordism is the common rule and little has been done to help the farm people. Schooling is lacking or limited in scope so that the illiterate rural people are unable to help themselves. Higher education also is limited and but little research work in agriculture has been done. Thus, despite hard work by the farmers, poor cultural methods result in low crop yields and limited supplies of food and feed.

The primary land use is for the production of food grains such as wheat and rice. Animals, even though expected to supply milk and power as well as meat, have to eat largely the crop residues such as straw, or search for feed on the overgrazed ranges and wastelands. In addition to the ill-effects of overgrazing, man has made the situation worse by destroying the tree and shrub cover to supply fuel.

BASIC ECONOMIC PROBLEMS

The objective of the agricultural study is to improve the living standards of the rural people by increasing total agricultural production and production per worker. Supplies of raw material for industry and products for export will be increased at the same time.

In Iran, the agricultural problem is not one of insufficient arable land. There is a total area of some 50 million hectares which might be farmed if, to the extent needed, water and machinery were made available. At present, only about 4.6 million hectares are cropped annually.

While agricultural labor now is a limiting item in terms of food production, when machinery and improved methods are introduced the situation may be distinctly improved to the advantage of all segments of the economy. In the meantime, capital in the form of farm machinery, operating capital and irrigation water should be added to increase agricultural production.

Farm management is faulty as a result of the lack of agricultural information, the illiteracy of the peasants and the absentee landlord system. Decisions which affect production are divided often among the landlord's agent, the men who furnish animals for plowing and a group of several peasants who provide the labor. As a result, land, labor and the various forms of capital are poorly integrated. The laborer's share is usually inadequate and opportunities for becoming independent owner-operators are almost entirely lacking. This situation must be remedied if the aims of the Plan are to be achieved.

The agricultural section of this report contains a detailed presentation of some of the conditions that will limit the application and administration of the improvement program as recommended. Among those conditions are: the scarcity of trained personnel in agriculture, the incompetency of public officials, the wide-spread feeling of insecurity, and the inadequate facilities for marketing farm products. An effective organization for agricultural research and extension work should be planned and activated as promptly as it can be accomplished. This is recommended as a basic means of overcoming or at least ameliorating the difficulties mentioned.

INCREASING CROP PRODUCTION

The low level of crop production in Iran is explained in the full agricultural section. The choice of crops grown has not been good. Relatively too much area is devoted to some crops like wheat and barley and not enough to forage for livestock, fruits and vegetables, or some high-value field crops like cotton and flax.

Poor cultural methods also are limiting agricultural production. Inadequate tillage equipment and practices combined with poor quality seed and improper seeding methods result in uneven plant stands. Improper planting methods and poor tillage and cultivation equipment make weed control and proper irrigation difficult, and crop yields low. Crop enemies—plant diseases, insects and weeds—are not well controlled. The total effects of these errors and omissions are low production and low quality. Further reductions in total crop production result from losses which occur during and after the harvesting of the crops.

There is a lack of knowledge about fertilizer needs and uses. The limited amount of low-quality animal manure is used largely for fuel, green manuring crops are not grown, and plant roots constitute the only crop residue left in the fields to add to the soil organic matter. There is no organized research information about chemical fertilizers. Likewise, there is only a superficial knowledge about the soils on which, through soil management, to build a program of sustained productivity.

It is pointed out that none of the foregoing crop production problems can be solved satisfactorily without an effective agricultural research, teaching and extension program. Methods are discussed for increasing the production of certain desired crops by the activities of such a program.

WATER UTILIZATION PROBLEMS

The supply of water available for irrigation is the principal limiting factor in crop production, yet the supply of available water is being wasted extensively by primitive methods of distribution.

In order to use irrigation water efficiently and effectively there must be a skillful combining of the science of soil, water and plant relationships with the arts of irrigation farming. The lack of tillage machinery detracts seriously from irrigation art as practiced by the peasant farmers.

IMPROVEMENTS IN ANIMAL PRODUCTION

Animal numbers have been high in relation to the feed supplies. Very little cultivated land has been used directly for growing forage for livestock. There has been unrestricted grazing of natural forest and range lands by excessive numbers of cattle, sheep and goats. Overgrazing has resulted in range deterioration and a decreased production of forage.

Largely as a result of inadequate feed, the production of all animal products has been low. Almost nothing has been done to increase, through scientific breeding and selection, the output of meat, milk, wool or eggs. Neither selection within native breeds nor the introduction of improved foreign stock has been tested carefully or practiced by commercial producers.

Animal food products of all kinds have reached the consuming public in an unattractive and unsanitary condition owing to a lack of inspection and sanitation services. Products for industrial uses, such as wool, goat hair, cashmere, lamb pelts and hides have been of low quality or have had limited usefulness because there has been no grading and standardization service. Practically no research or extension work has been done among either tribal or village people to correct the existing conditions.

Poor management and poor marketing practices have wasted feed, increased livestock losses and reduced the marketable supply of livestock products.

Livestock death losses have been unusually high owing, presumably, to the inroads of diseases and parasites. In this report it has been emphasized that feeding practices which approach a starvation level have predisposed animals to disease and death. Control of diseases through vaccination has been ineffective owing to poorly organized and administered campaigns. In any event, such campaigns can be effective only in areas where livestock numbers are approximately in balance with feed supplies.

FORESTS AND RANGES

The subhumid mountain areas of northern and northwestern Iran once were covered with forests of predominantly hardwood types of trees. Less dense stands of trees and brush occurred throughout much of the Zagros mountain range in western and southwestern Iran.

Today there remains but little untouched timber in the Caspian region and vast areas of mountain and plain in all parts of the country have been completely denuded of trees and shrubs. Unfortunately, the forest material has been used wastefully. An ever-widening search for material from which to make charcoal and for fuel for the primitive-type ovens of householders and small bakeries has cleared both brush and small trees from large areas. Large trees have been cut down by charcoal makers who have left the trunks to rot, or the tops have been cut out repeatedly with a resultant misshapen, distorted trunk left standing.

The continuing damaging practices of charcoal makers have been coupled with or followed by heavy overgrazing with sheep and goats. The latter are the only domestic animals which can survive on woody, unpalatable species that remain or follow the destruction of forest grass undercover.

Foothill range areas, perhaps never forested, have lost both the brush and grass cover and are now occupied largely by short-season, annual and winter annual grasses. Such species have but little total grazing value and frequently they afford no winter protection to the soil. Destruction of the sparse cover on desert plains and foothills by fuel gatherers and hungry animals has been followed by water and wind erosion and damaging dust storms.

The seriousness of the erosion problem has been fully emphasized. Plans have been presented for improving existing conditions through a control and educational program to be administered by a forest and grazing service.

PROBLEMS IN AGRICULTURAL MECHANIZATION

Low production per worker probably has been the most important reason for the low living standards of the peasants. Manpower simply cannot compete with machine power in producing crops.

Past efforts to mechanize agriculture have been neither efficient nor effective. Some tractors and plows have been introduced. Through their use better plowing was done and manpower was saved. Since there were no drills, cultivators, or harvesters to use with the tractors, however, very little more land could be farmed and the total seasonal labor demand remained high to take care of the harvesting with hand methods. Furthermore, numerous tractors brought into Iran have been rendered useless because of inadequate repair and spare parts service. Despite a strong current demand for tractors and equipment, only a small volume has been imported primarily due to the lack of credit facilities for both dealers and farm purchasers. Plans have been presented to overcome the preceding difficulties. Guidance will be needed to handle the proper distribution of new machinery and the development of machinery service stations well-located in rural areas or smaller towns.

There has been a lack of trained operators for tractors and other equipment. Improper kinds and types of machines have been imported with unsatisfactory results. The desirable practice of operating farm machinery on a custom basis has not been developed as extensively as it should have been. A machinery agency has been recommended to operate under the Plan to help overcome some of the present handicaps to agricultural mechanization. An educational program of machinery research and extension has been recommended also to develop this work and to increase the use of machinery in Iranian agriculture.

AGRICULTURAL EDUCATION PROGRAM

In the agriculture section it has been pointed out many times that the lack of knowledge about improved or modern methods and practices has been a great handicap to agricultural production.

The present agricultural education program is confined to the training of a limited number of students through the three-year formal program at Karaj College. The inadequately-trained graduates have gone largely into Ministry of Agriculture employment where, for the most part, they have been out of touch with farm people and rural conditions.

There is urgent need for a complete program of agricultural education which will include a four-year agricultural course at Karaj with an enlarged staff and a more complete course of study. To overcome the lack of accurate, basic and scientific knowledge about soils, crops, livestock, machinery, farm management and marketing, a new Research and Extension Institute has been recommended. In addition to conducting a nationwide program of research in the various phases of agriculture, the Institute as planned also will organize and administer a well-distributed program of rural teaching through ostan extension specialists and shahristan agents.

The experimental or research work will be carried on in every ostan through main stations and sub-stations. Each center will be staffed with trained personnel, partly foreign, who will conduct a correlated experimental program to determine the best methods and practices to use in producing the crops or livestock adapted to or common in each area.

Teaching by demonstration is a most effective way to secure the adoption of new ideas. Several demonstration-type plans have been presented, therefore, to be carried out in a number of rural areas under the supervision of agricultural extension personnel. They are designed to do such things as the following:

1. Establish peasants as independent farm operators in areas such as the Gurgan Plain where extensive cropping can be carried on with natural rainfall.
2. Show how production, per peasant, of cereals such as wheat and barley can be increased under dryland conditions, with the village economy through the use of extensive farming methods.
3. Demonstrate satisfactory methods of establishing independent farm operators on balanced-unit Government-owned land with water developed for irrigation.
4. Show how production per peasant can be increased by making additional water available so that, with machinery, more land can be farmed.
5. Indicate a means of adding farm machinery to an irrigated village economy by extending the amount of adjoining dry-land area farmed.
6. Establish a program of soil and water conservation through range and forest control measures applied to a natural watershed area.
7. Teach livestock producers the importance and value of growing forage and feed crops to reduce winter death losses and increase the production of meat, milk and wool.
8. Demonstrate methods of improving the native sheep through selection of breeding stock coupled with better feeding and management.
9. Make it possible to improve overgrazed rangelands through a program of producing seed of range grasses.
10. Demonstrate how cut-over, but fertile wasteland can be reclaimed and used for the production of rice and forage crops in the high rainfall and irrigated Caspian area.

SPECIALIZED PROJECTS

Plans have been presented for the establishment of a number of special-purpose projects of a miscellaneous character. The nature of those projects is indicated by the following subjects:

Emergency relief and rehabilitation
Animal improvement and disease control

Control of plant diseases and insects
Seedstocks program
Organization for importation of machinery
Company to supply goods and credit to peasants
Swamp drainage for disease control
Inspection service for meat and milk
Fish and game conservation
Standardization service for crop and livestock products
Soil and water survey and classification
Fruit processing, drying and packing.

These projects should help to improve the level of living of Iranian peasants by breaking down many of the barriers which now limit their progress. Some are designed to provide information, others to provide equipment and supplies so sorely needed. A detailed discussion of each project may be found in the agricultural section of this report.

Summary of the recommended allocations of Plan funds for the agricultural program is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ Years	Total
Education program	14,250	56,004	120,450	190,704
Projects for ostans	41,700	222,739	1,569,545	1,833,984
Special projects	42,546	127,583	555,936	726,065
Agricultural credit	30,000	85,000	414,881	529,881
Total	128,496	491,326	2,660,812	3,280,634
Portion of above required for foreign exchange	53,106	230,310	1,051,749	1,335,165

WATER RESOURCES

Since every possible effort must be made to expand agricultural production, sharp attention must be focused on the available water resources and on the possibilities of their future development.

Up to the present Iran has relied mainly on rain-fed crops, which has meant winter crops; irrigation has been piecemeal and on a very small scale, chiefly by the use of kanats. Whereas there are great possibilities of extending the areas under rain cultivation, and of improving existing methods of cropping and cultivation, as has been pointed out in the section dealing with agriculture (Vol. III), it is only by increased irrigation that a stable agricultural expansion will be possible and effective use made of Iran's limited water resources. Reliable water storage is the best defense against the wide climatological fluctuations which are a feature of the territory, and should make possible all-year cultivation.

Unfortunately, owing to geographical and topographical features, the major portion of Iran's annual rainfall now runs off uselessly to the seas or to neighboring territories. Only certain inland basins retain the relatively low precipitation, and even this meager contribution is largely lost by useless evaporation owing to the lack of forests, grass cover and suitable storage.

We are satisfied that, considering the demands from all sources emanating from an increasing population and from rising standards of living, Iran's average annual rainfall will be sufficient only if intensive conservation methods are practiced and the maximum amount of water is re-used.

In the general conservation of water, the reduction of loss and waste can be achieved by the following methods:

Reforestation of headwater areas of catchments

The introduction of better irrigation methods and of enlightened water-land-use policies and laws

Diversion to inland basins and storage of surface waste waters

The interception of underground waters and skillful replenishment of this source of supply.

Sound engineering is of primary importance in the implementation of a program of water conservation which should make possible an increased and regular supply of water for agricultural, potable and industrial needs. But we consider sound legislation nearly as important as engineering and in nearly all instances this legislation should precede engineering or both should be initiated concurrently.

The following is a brief summary of the main items of legislation required at an early date in order to implement the plan:

1. The establishment of a permanent, non-political Central Water Authority, with full statutory powers to act as trustee for the nation's water resources, having its head office in Tehran but decentralized into at least four "water provinces". There is no need to create a new authority as such. The present Independent Irrigation Corporation should be expanded to become the Central Water Authority.
2. In addition to the setting up of a Central Water Authority, legislation is required authorizing the requisition of land, the establishment of water boards in towns, and legislation covering the prevention of mis-use, waste and pollution of water in towns and cities.
3. The establishment, as a branch of the Water Authority, of a survey organization, capable of launching survey and mapping programs involving the maximum use of air survey methods. (See section dealing with surveying and mapping, Vol. III.)
4. The establishment of an efficient meteorological organization and a national network of meteorological stations to cover agricultural, aviation and other needs. (See section dealing with meteorology, Vol. III.)

In the face of almost universal need for water, lack of reliable information, and limited funds, it is not easy to formulate a set of priorities for the development of water resources. Any set of priorities should be concerned not only with the question of the timing of schemes in order to fit into a given program but also with relative needs.

Having examined the likely future water demands from all sources, we are satisfied that agricultural needs will constitute over 97 per cent of the total water requirements. We consider, however, that the need for pure, potable water supplies in towns and villages takes precedence over all other water demands. But the development of potable water supplies is intimately bound up with schemes for town improvement and housing, (Vol. III), and is treated in that section.

Whereas it is essential to take immediate steps toward development and conservation of water resources there is a distinct danger that precipitate action aimed more toward the showing of early results than toward a balanced order of development may lead to the initiation of schemes which would not subsequently fit into the long-term plan of development satisfying the criterion of maximum benefit to the greatest number. The following is a brief list of priorities as recommended in this section.

1. Legislation involving the establishment of a competent authority and subsidiary organizations such as the survey and meteorological organizations referred to above.
2. Final investigations relating to schemes where knowledge is already far advanced and where it is only necessary to choose between alternative locations and capacities. Coupled with this priority is the execution of schemes for which little or no further studies are required.
3. Urgent studies relating to whole catchment areas of considerable water resources capable of multi-purpose development and where possibilities of re-use are high.
4. Studies covering other projects scheduled for investigation together with reconnaissance work on new projects brought to notice as maps and information become available as a result of priority (1) above, followed by an orderly program of execution to be intensified toward the end of the plan period.
5. Long-range planning with a view to providing continuity at the end of the plan period.

Apart, then, from the obvious first priority of legislation and the initiation of a mapping program and of meteorological and hydrological observations, the immediate practical priority is No. 2 above, which may be divided into two parts:

Surface schemes which have been investigated in sufficient detail to merit advanced investigations with a view to commencing design and construction

Development of sub-surface resources in areas where conditions are known to be favorable.

As regards surface schemes, of those listed by the Independent Irrigation Corporation there are only three major projects which we consider qualify for immediate consideration as regards design and construction. These are the Karaj, Zayandeh Rud and Jajirud (Latiyan) projects. The need for agricultural expansion is so great that it will not be possible in all cases to defer the development of water resources until sufficiently reliable statistical and study data become available to meet immediate needs; therefore it is proposed to start at once a limited program of sub-soil development which will alleviate the needs of those areas in which water shortage is most acute. Exploratory work in connection with individual schemes will not take long and there is sufficient plant in the country to commence a program and to carry on until new equipment arrives, provided orders for new equipment are placed in time.

We believe that of the three main methods of underground water development in Iran: kanats, pumped wells, and buried cut-offs in narrow valleys, the major effort should be concentrated on the development of wells, and that new kanats should be constructed only in cases where there is convincing evidence favoring such a course.

There are many localities in Iran where shallow underground waters may be easily and economically diverted by means of buried cut-off construction, and we recommend that exploration work should be undertaken with a view to preparing a list of possible sites. In order to commence the program we recommend that early priority should be given to investigation of the following areas: Kan, Karaj, Tabriz (Falkhed Rud), Shahpur, and Firuzabad.

When planning development of water resources it is essential to be on the alert for possible benefits arising from "by-products". There are many large catchment areas in Iran where the water resources are such that multi-purpose development is possible and we have therefore stressed the need to concentrate on the execution of comprehensive studies covering complete catchment areas such as the Karun, the Kur, and the Sefid Rud systems. In addition it is considered that the possibilities of developing hydro-electric power by high head non-storage schemes are very favorable, especially in the Caspian (North Elborz) Region, and special recommendations have been made concerning this subject.

Summary of the recommended allocations of Plan funds for the water resources program is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ Years	Total
Central Water Authority ..	14,500	18,000	127,500	160,000
Survey of resources	11,000	13,000	96,000	120,000
Development of underground resources	94,000	43,000	209,000	346,000
Construction of reservoirs, canals, etc.	30,500	29,000	1,164,500	1,224,000
Total	150,000	103,000	1,597,000	1,850,000
Portion of above required for foreign exchange	69,000	49,000	477,000	595,000

METEOROLOGY

Serious planning of water resources development, to cover long-term needs on a sustained yield basis, requires accurate information and statistics relating to meteorology and hydrology. Such information should have been obtained over a sufficiently long period to cancel out the errors and irregularities due to daily and annual fluctuations. Such statistics are not at present available in Iran, and the need is most urgent to establish the means whereby progressively more accurate information can be obtained. We have, therefore, recommended the immediate establishment of a separate meteorological organization, responsible for planning meteorological observations and collation and publication of observed data, including the daily weather forecasts and synoptic observations required for civil aviation purposes. We have set out in detail in the meteorology section (Vol. III) a recommended program of action, together with our conclusions and recommendations, bearing in mind the recommendations of the International Civil Aviation organization and the International Meteorological Association, of which organizations Iran is a member.

Summary of the recommended allocations of Plan funds for the meteorology program is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ years	Total
Domestic	1,750	3,340	23,240	28,330
Foreign Exchange	1,360	2,550	4,490	8,400
Total	3,110	5,890	27,730	36,730

SURVEYING AND MAPPING

Sound planning requires reliable large scale maps. Maps of the required degree of iability are not available and should be produced. The only means by which such maps n be produced in time to be of use to the Plan will be to start the survey program imediately and to use air survey methods. Our recommendations, together with a program work, have been set out in detail in the surveying and mapping section (Vol. III). Maps ust be available early in the program to enable planning to proceed, and must be of a high andard.

Summary of the recommended allocations of Plan funds for the surveying and apping program is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ years	Total
Domestic	8,690	29,120	82,690	120,500
Foreign Exchange	19,800	54,600	128,100	202,500
Total	28,490	83,720	210,790	323,000

TOWN IMPROVEMENT AND HOUSING

OWN IMPROVEMENT

The orderly planning of towns should, under ideal conditions, precede many of the rks envisaged in the Seven Year Plan, as, for example, potable water supplies, housing, ation of industry, electric power distribution, telephones, etc. For Iran the problem is coming increasingly important owing to the drift of population from rural to urban eas. Unrestricted and unplanned development, with resulting high speculative land ices, will greatly increase the cost of Government- and municipal-sponsored schemes.

Following is a brief summary of the main items of legislation required at an early te to implement the plan:

1. The setting up of a Central Town Planning Bureau to collate statistics and investigations, arrange for town surveys, draw up town planning codes, provide technical assistance to municipalities in the preparation of town planning schemes and to prepare information and arrange publications.
2. The setting up of a Central Housing Authority having powers to sell or lease properties, and subsidiary legislation necessary for the proper functioning of the Central Housing Authority, such as regulation and requisition of land and property, formation of a Building Loan Society, power of condemnation, powers relating to slum clearance, revision of the present rent control act, and control of house design and construction.

We believe that town improvements should be made in the following order of iority:

1. Potable water supplies
2. Electric power
3. Road construction

4. Government and municipal buildings
5. Miscellaneous items such as sewerage, drainage, public parks and gardens, river improvement schemes.

The great need for mapping is apparent, and one of the first steps in the case of individual towns is to undertake detailed studies of the town requirements and to prepare a draft plan, which should be positive in conception, not relying on restrictive measures only. Such a plan should allow for participation by private enterprise, and should pay particular attention to the utilization of land, including zoning for industry, houses, and business quarters. For all new development on the borders of towns the collaboration of the Ministry of Agriculture should be obtained to ensure that agricultural interests are not subordinated to purely town interests.

In view of the large amount of work involved in the preparation of town plans and the present lack of technical staff, we recommend that draft plans be limited, during the Plan period, to those towns for which water supply schemes are being recommended.

We consider that the Plan Organization should provide technical assistance and advice to the municipalities, which should be the responsible authorities for the execution of draft plans and the implementation of schemes within their town limits.

In most of the larger towns redevelopment of the older areas, involving new housing, is essential.

LOW COST HOUSING

In most countries, under present world conditions, it has become almost standard practice to link with town planning a program of low cost housing construction, to cater to the low income groups. It is estimated from such statistics as are at present available that about 60 per cent of town dwellers exist in virtual slum conditions, which underlines the need for such a housing scheme.

We have investigated the various factors influencing the launching of such a program: types of houses required, unemployment figures, housing costs, land costs, average ratios of rent to income, and rent and population trends. The following possible methods of providing low cost housing have also been investigated:

Construction of low cost houses by the Mortgage Bank
The establishment of a special bank to be known as the Construction Bank
The promotion of housing schemes directly by the Government
The establishment of co-operatives
Direct grants to municipalities
Direct subsidies on each house built
Formation of building societies.

Our main conclusions are that private enterprise must be encouraged to assist this important work and we submit the following housing policy:

A co-ordinated housing program should be prepared and published throughout the country
Full encouragement should be given to private enterprise
Full encouragement should be given to the development of home ownership and to the collection of small savings
The general sanitary standards should be raised
The responsibility of housing should be de-centralized from the central Government to the ostans and municipalities.

The central Government should have over-all control and be authorized to require the municipalities to take action to deal with their housing problem

Financial assistance should be provided from the Central Housing Authority for certain housing schemes which cannot be self-liquidating or financed from outside sources

Financial assistance should be provided for slum clearance schemes

There should be power to condemn property

The rural housing program should be the responsibility of the Ministry of Agriculture.

Our general recommendations regarding municipalities and the functions of housing uthorities apply only to the larger towns. It will be several years before the smaller owns become sufficiently organized to carry out similar functions for themselves, and is recommended that such programs for smaller towns should come directly under the overnors General of the ostans, assisted by the ostan branch office of the Central Housing uthority.

The Central Housing Authority must have the power to appoint independent engieers and architects to act as consultants in the supervision and preparation of housing hemes, and a panel of architects and engineers able to act for the Authority should prepared for each ostan.

We have based our recommendations for a flexible program on the assumption at the Seven Year Plan funds should be controlled through the Central Housing Auority and allocated under the following broad subdivisions:

The Central Housing Authority organization
Loans to the Building Loan Society
Grants to the municipalities for slum clearance schemes
Subsidies for housing schemes not self-liquidating
Loans to the Industrial and Mining Bank and factory owners
Sundry loans.

We present in the full report (Vol. III) a list of housing projects which should started immediately in a number of towns.

OTABLE WATER SUPPLIES

The need for potable water schemes for the towns and for rural areas cannot be ressed sufficiently and reference has been made in our report dealing with public health the serious effects on the nation's health and efficiency arising from pollution and om polluted waters.

The combined efforts of the municipality and Bank Melli Iran have resulted in e initiation of the construction of a potable water supply for Tehran. We feel that e Plan Organization and the new Water Authority should spare no efforts to ensure at this scheme, although not specifically included in, nor financed by, the Seven Year lan, goes forward and is successfully completed at an early date. There can be no doubt at the rest of the country will look to Tehran for leadership.

In Shiraz the construction of a modern water supply system by private enterprise nearing completion. A report is now being prepared and is due to be presented shortly the Shrine authorities relating to a modern scheme for the Holy City of Meshed, and preliminary report has been made on the feasibility of a water supply scheme for andar Abbas.

Apart from these projects, either constructing or to be constructed, there are piped water supply schemes only at Abadan and at Ahwaz, the latter being a partial scheme.

The design of modern water supply systems is hampered by the lack of statistics, the lack of town planning in the past, and by the absence of large scale reliable town plans. Towns have been growing rapidly and development has been illogical and haphazard. In the section dealing with surveying and mapping, we recommend that air survey maps be prepared quickly for those towns which are on the priority list for water supply schemes. We recommend further that studies be made and draft plans be prepared for all towns on the list for water supply schemes under the Seven Year Plan. We also recommend that the following broad policy should be adopted in the provision of potable water supplies:

> Schemes for the supply of potable water to take priority over all other water development projects.
>
> The water resources of the country to be coordinated and controlled by a Central Water Authority, as recommended in the section dealing with the water resources.
>
> The Central Water Authority to be responsible for allocating funds from the Seven Year Plan by way of loans to municipalities for water supplies.
>
> The Central Water Authority to be given statutory powers to undertake water supply schemes.
>
> Water supplies for each town to be operated and managed by a non-political water board or corporation.
>
> Water to be charged at rates sufficient to cover running costs, plant depreciation, loan charges, debt repayments and a reserve fund.
>
> Legislation to be introduced with a view to preventing misuse, waste and pollution of water.

In the full report we present a list of the towns which should be included in the Seven Year Plan for water supply schemes, and it will be noted that in order to carry out the program, municipalities will have to contribute about 20 per cent of the cost of their systems.

The provision of adequate supplies of potable water for rural communities is of very great importance, as stressed in our report on public health. With the limited capital resources and technical skill available, however, it is clearly impossible to provide piped supplies. We have, therefore, recommended that potable supplies to rural communities should be provided in conjunction with irrigation projects wherever possible. The supply should be piped to public fountains. In other areas where irrigation projects are not under consideration technical assistance should be made available without charge, to give advice on such matters as protection of supplies from contamination and the installation of inexpensive filters. The cost of carrying out rural work would have to be borne by the villagers or the landowners.

We have not recommended that any waterborne sewage or drainage schemes be constructed under the Plan, as funds are not sufficient. We consider that inexpensive, poorly conceived and badly executed schemes would in many ways make present conditions worse. The absolute first priority must be for potable water schemes. Apart from the above considerations the recommended program for potable water schemes will tax the resources of the country to the full and it is doubtful whether additional city projects could be implemented even if funds were available since the amount of work undertaken will be limited by the availability of labor, skilled technicians, competent conactors and trained engineers and operators. The experience gained not only in con-ruction but in the operation of water schemes could be capitalised at a later stage when nds are available for the execution of sewage and drainage schemes.

Iran is fortunate that in general the water table is deep below the surface and the wn drainage is good. Exceptions to this rule are Ahwaz, Resht and Isfahan, and it is commended that project plans should be completed in the course of the next seven years enable construction of sewage and drainage schemes to be undertaken for these areas.

ODERN PRISONS

In recognition of the fact that the state of prisons throughout the country is latively bad, Rls. 200,000,000 were allocated in the Plan Act for the construction of modern isons. After due consideration and investigation we have come to the conclusion that, ile we fully agree with the need for reform, the expenditure involved in such a program uld be included in the yearly budget and should not be borne by the Seven Year Plan. e, therefore, recommend that this sum be held in reserve for use to meet future con-gencies which may arise in the Plan program.

As regards the modernization of prisons we have given our general comments only. ese are not intended as recommendations in view of the fact that we consider that the ole matter should be thoroughly investigated and reported on by a commission pointed by the Majless.

DGET

Summary of the recommended allocations of Plan funds for the town improvement housing program is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ years	Total
Town improvement	7,500	25,000	467,500	500,000
Low cost housing	10,000	195,000	1,295,000	1,500,000
Potable water supplies	10,000	30,000	710,000	750,000
Modern prisons	—	—	—	—
Total	27,500	250,000	2,472,500	2,750,000
Portion of above required for foreign exchange	5,700	42,500	626,800	675,000

TRANSPORTATION

ERAL

It is a basic conclusion of this report that the lack of adequate means of transpor-on has seriously impeded the economic growth and social integration of Iran. The s favored by nature for the development of a substantial population are relatively , and are generally separated by considerable distances and natural barriers. As a lt, these centers have attained their growth with a maximum of self-sufficiency and inimum of economic and social intercourse.

This condition has not been favorable to a well-balanced economy. Regions well pted to the production of certain foods or manufactures in large volume have been restricted to the consumptive capacity of a local market, while regions deficient in such goods have been unable to supply the deficiency, even though capable of producing goods acceptable for exchange.

This generally undesirable condition frequently becomes acute, when crop failures bring virtual famine to certain regions while others have surpluses of food but no adequate transportation.

Only 25 years ago were plans actively put in process to build a railroad to connect the Persian Gulf on the south with the Caspian Sea to the north, passing through Tehran, the capital. This railroad was completed in 1317. During the same year additional lines were begun from Tehran to Tabriz, from Garmsar (between Tehran and the Caspian Sea) to Meshed, and from Ghum to Yezd. Construction of these lines was interrupted by the war, and their completion is a matter to be dealt with under the Seven Year Plan.

The present system of highways is also new within the past 25 years. Previously communications were of the most primitive kind. The highway system was soundly conceived but, generally speaking, the roads were neither well located in detail nor well constructed. Maintenance has also been inadequate, with the result that the highway system as a whole falls far short of providing for the easy and economical transport of goods and passengers which we consider essential to the success of the Seven Year Plan.

Our study of transportation needs leads to the inevitable conclusion that the principal cities, ports and producing areas should be linked together by a system of ground transportation which should include a primary network of arterial roads. These roads should be so designed and built that transit over them can be conducted safely at reasonable speeds. In most cases this calls for a certain amount of relocation to improve alignment and grades, and improvement of the whole network by providing adequate grading, bridges and culverts. We recommend that, in the first instance, these roads be given a surface of water-bound macadam six meters wide and that, after sufficient settlement has taken place, an asphalt surface should be applied. The funds for asphalt surfacing are being accumulated outside the Seven Year Plan by the imposition of a tax on gasoline.

Owing to the lapse of trade with and through Russia, the only active seaports are on the Persian Gulf and, of these, the two most important are Khorram-shahr and Bandar Shahpur. Both of these ports are served by the Iranian State Railways, whereas no others are.

It is expected that the operation of the Seven Year Plan will cause considerable increase in the external trade of Iran and for this reason, as well as to provide a better geographical distribution of port facilities, it is proposed to devote a large part of the available funds to restore deferred maintenance and increase the handling capacities of the ports of Khorram-shahr, Bandar Shahpur, Bushire and Bandar Abbass. It is envisaged that a port capacity of 5,000,000 tons per annum may ultimately be required, but the funds provided in the Plan allow for but a fraction of such expansion. The tentative allocation under the Plan was Rls. 250,000,000. We recommend the increase of this figure to Rls. 394,430,000 by diversion from the amount tentatively allocated to railroads. This latter sum will permit only these necessary undertakings: making up deferred maintenance; urgently needed improvements at the four ports named above; setting up a port and inland waterway administration; training personnel for responsible posts in such administration; and the beginning of studies for long-term port development.

In the meantime, a state of emergency exists. The port of Khorram-shahr is prac- cally blocked, and Bandar Shahpur is unable efficiently to cope with the vessels diverted om Khorram-shahr. Bushire and Bandar Abbass are practically idle, but the former uld be used to some extent under present conditions.

For advice in dealing with the immediate situation, the Director-General of Cus- ms employed a Dutch port expert, C. G. Meerburg. Although Mr. Meerburg's problem as one of emergency action and, therefore, perhaps not formally within the scope of e Seven Year Plan, it was agreed by all concerned that there should be consultation and -operation between us in order to avoid conflict between the emergency procedures and e long-term planning. This result was accomplished and we concur with Mr. Meerburg's commendations for dealing with the immediate situation. It is hoped that appropriate tion has been taken to put these recommendations into effect.

The development of aviation in Iran is naturally somewhat recent. There is, how- ver, an actively functioning Department of Civil Aviation under the Ministry of Roads, d this department has been engaged for some time in making plans for the extension d improvement of the country's airports.

Tehran is at present the terminus for a number of international routes, while badan, to the south, might become an intermediate stop on other international routes suitably developed. Airports at the other principal cities are served by Iranian Air- es, which operates service of one or more flights per week, connecting these cities with hran. With two exceptions, these airports have unpaved runways and no buildings r passenger accommodations.

The Department of Civil Aviation is already engaged in constructing a new ter- inal building and appurtenant facilities at Mehr-abad Airport, which serves Tehran. e are informed also that an appropriation had been granted for the purchase of elec- ical, electronic and radio equipment, which will be sufficient to establish an adequate odern control system throughout the country and provide Tehran and Abadan with all e requirements of officially classified Class A international airports. Further steps ntemplated under the Plan are the widening and lengthening of the runways at Mehr- bad, and paving runways and erecting station buildings at airports serving the other rincipal cities.

While the Plan Act stipulates that the construction of hotels to attract foreign urists should be provided for, it does not include funds for this purpose. We have not de any recommendations of specific projects for hotels, as we believe that such under- kings should be made by private investors as strictly commercial enterprises.

RESENT CONDITION OF RAILROADS

We have inspected the existing railroad system and looked into its operation to me extent. This subject is covered at length in our main report and it would be diffi- lt to summarize it in a short space. We may, however, make these brief comments. irst, the present operation is inefficient because of the apparent political necessity of taining many more employees on the payroll than the operation of the road requires. econd, the physical condition of the roadway and track is good, judged by the usual andards for railroads carrying a comparable volume of traffic. Third, the condition the motive power is very bad and, unless it is promptly remedied, will bring about a complete paralysis of railroad operations which, in turn, would seriously affect (among other things) the distribution of petroleum products over a wide area and cause severe distress to a large portion of the population.

Our report recommends the immediate appropriation of the equivalent of $7,950,000 in foreign exchange for the purchase of materials to repair existing locomotives, 18 new diesel locomotives (1,000 horsepower, all-purpose units), and 30 new passenger cars which are badly needed.

We have been informed that funds for these and other railroad capital requirements are to be made available from a payment of £5,700,000 ($22,800,000) by the British Government in final settlement for use of the railroad during the war and, therefore, that funds need not be provided from the Plan, but it is a prerequisite to the operation of the Plan that both railroads and seaports be put in condition to operate efficiently.

PROPOSED RAILROAD EXTENSIONS

The extensions here under consideration are:

Garmsar-Meshed	
Total length—kilometers	811
Completed—kilometers	314
Remaining to complete—kilometers	497
Cost to complete—rials	559,000,000
Foreign exchange included—rials	169,000,000
Tehran-Tabriz	
Total length—kilometers	737
Completed—kilometers	439
Remaining to complete—kilometers	298
Cost to complete—rials	1,226,200,000
Foreign exchange included—rials	139,700,000
Ghum-Yezd	
Total length—kilometers	476
Completed—kilometers	98
Remaining to complete—kilometers	378
Cost to complete—rials (more than)	460,000,000
Foreign exchange included—rials	unknown

It does not appear that any of these railroad extensions were conceived with the idea that their operation would be profitable. In spite of the large expenditures already made on them, the estimated return on the expenditures required for their completion is modest in the case of the first two, and nonexistent in the last.

On the other hand, both Meshed and Tabriz are large centers of population, and both are separated from the capital by considerable distances. It is our conclusion, therefore, that since these lines will probably be self-supporting when completed, they should be included in the Seven Year Plan.

Our conclusion with respect to completing the line from Kashan to Yezd is the opposite. The populations involved are much smaller, and the prospective traffic quite insufficient to pay operating costs. For these reasons, and because available funds can be spent to so much better effect on roads and seaports, we believe that completion of this railroad should be deferred beyond the present Seven Year Plan.

Other things being equal, the logical procedure would be to complete both the Meshed and Tabriz extensions as rapidly as possible. To do this, however, would require the use of all the money available for railroads, highways, ports and airports for the better part of three years. This is both impractical and unfair to the great remainder of the country. Such being the case, it is desirable to complete either one or the other as promptly as possible, since neither can earn a return until it is completed for the full length.

We have given preference to completing the railroad to Meshed for these reasons:

It could be completed in shorter time

Its cost of completion is less than half as great as the Tabriz line, thus making more money available for other projects in the earlier years

The highway between Tehran and Tabriz can be reconstructed and made an adequate traffic artery at far less cost and in shorter time than the highway between Tehran and Meshed, thus again making more money available for other projects and other sections in the early years, without substantial damage to Tabriz and its surrounding territory.

ROADS

Since practically all the roads in Iran require reconstruction or new construction in greater or lesser degree, our principal problem here has been one of priorities. In approaching this problem, we have considered three principal factors: first, the importance of the road itself, in terms of the communities served or interconnected; second, the present condition of the road as we observed it; and third, the availability of another means of transport, that is to say, a railroad line. Put more briefly, we attempted to give priority to the projects which would produce the greatest good for the greatest number.

The basis of our study was a list of 22 projects prepared in the Ministry of Roads prior to our arrival. This list included practically all the important roads in the country and a few new ones, with some estimate of the cost of the improvement. After some study of the costs of recent work we thought it wise to increase these estimates somewhat, although by doing so we exceed the total amount tentatively allocated under the Plan. We think it important, however, that a sufficient amount be spent to get a system of roads which will encourage rather than discourage the transport of people and commodities.

A prime requisite to the road-building program is the provision of modern road-building machinery. At present there are hardly more than one or two such machines in the entire country, and construction and maintenance are both performed by the most primitive methods, with untold waste of man power. Since the execution of the Seven Year Plan is expected to put something of a strain on the country's man power, it is important that it be employed efficiently, but besides that, all our cost estimates are based on the use of machines and would be incapable of achievement without them. After careful consideration, we have prepared a list of machinery and tools, which is included in the body of our report. The estimated cost of this machinery is $2,000,000, or Rls. 65,000,000.

AIRPORTS

The general program for airports has been set forth above. Here, as with ground transportation, the question of priorities in time assumed importance, but the solution was simpler, in that the needs at Tabriz, Shiraz and Meshed are particularly great and these are three of the most important cities.

BUDGET

Summary of the recommended allocations of Plan funds for the transportation program is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ Years	Total
Roads	67,000	224,600	2,128,900	2,420,500
Railroads	60,000	95,000	1,630,250	1,785,250
Seaports	8,100	122,130	264,200	394,430
Airports	20,000	60,000	330,000	410,000
Total	155,100	501,730	4,353,350	5,010,180
Portion of above required for foreign exchange	69,260	86,150	514,800	670,210

COMMUNICATIONS

The communications service in Iran consists of local and long distance telephone systems, a telegraph system, short-wave radio communications facilities, and some international short-wave and local broadcasting facilities. The major part of the local telephone system and some long distance plant are operated by a private concessionaire, the Iranian Telephone Company; and the principal long distance system is operated by the Ministry of Posts, Telegraphs and Telephones. This Ministry also operates the telegraph system. There is no connection between the local and long distance telephone facilities, and a national telephone service is non-existent. In connection with its own operations, the Iranian State Railways operates telegraph lines along its right-of-way. Radiotelegraph and telephone service communications with foreign countries are operated by the Ministry of Posts, Telegraphs and Telephones. The broadcasting facilities which are located at Tehran and Tabriz are also operated by it.

In general, all communications facilities are inadequate for present needs because of poor maintenance, insufficient capacity, or obsolete design. There is an unnecessary duplication of telephone and telegraph lines by the several operating agencies. There are about 24,000 telephones in service throughout the country, representing a density of .133 telephones per 100 of population, which is far below the development in other countries of comparable status. Tehran has a 6,000-line automatic exchange which is in good condition, but service is poor because the equipment is grossly overloaded. Expansion now in progress will add 22,000 lines. In all other cities magneto-type central office equipment is used which, including outside plant, is generally in very poor condition.

The long distance lines of the Telephone Company are poorly constructed and technically inadequate. The long distance lines operated by the Ministry of Posts, Telegraphs and Telephones are in fair condition with respect to outside plant, but the carrier and terminal equipment is poorly maintained.

The international radiotelegraph and telephone equipment is generally satisfactory nd properly installed, but two of the principal transmitters are inoperative because of ck of tubes. The service is good between Tehran and established foreign points, but ere is no interconnection with the internal communications system.

For both the internal telegraph system and telegraphic communications with foreign ountries over the wire line system the equipment and operating procedures are obsolete. ervice is notoriously slow and unreliable, and operation and maintenance are inefficient.

The broadcasting transmitters in Tehran are in good condition, but the transmitter Tabriz is in poor condition. The studio facilities in both locations are substandard in uality and those in Tehran are too small.

Improvement of the country's communications system is an important part of the even Year Plan. Aside from providing better service to people in general, it is an essen- al part of the execution of the Plan as co-ordination and administration of the Plan would severely handicapped without adequate communications. Our recommendations are ade, therefore, to accomplish the following goals:

Meet the requirements of commercial and industrial development
Knit together more closely the people of the country
Provide an effective means for dissemination of information and educational instruction
Provide a rapid and reliable means of communications for the internal security of the country.

It is generally recognized that the best telephone service results from a single ency operating within a complete national territory. This condition does not obtain Iran since the Government and the Telephone Company are each operating long dis- nce telephone services.

We recommend that these services be consolidated. After giving consideration the relative advantages and disadvantages of Government and private operation, we commend that all internal telephone service be provided by a single private corporation erating under a concession from the Government. By this means continuity of adminis- ative direction can be assured, service improved, and, most importantly, private capital n probably be attracted for the recommended expansion of the telephone service under e Seven Year Plan.

We believe, however, that the internal telegraph system, the international radio- legraph and telephone system, marine radio, and the internal broadcasting system ould continue to be operated by the Ministry of Posts, Telegraphs and Telephones. ur reasons are that this operation is a continuation of present practice in Iran and that can probably be adequately improved by the existing Ministry.

In order to determine the the scope of telephone and telegraph service required, d to provide detailed data for the selection of type of plant, the following basic studies houl be made:

A commercial survey for determining the extent of service required
A loop and trunk study to relate the cost of plant components with standards of transmission
A toll centering study to determine the location of primary and secondary long distance traffic centers

A point-to-point traffic study to determine the necessary capacity of the facilities

A cost comparison study to determine the best of the several alternative solutions available for any project.

We do not consider that the present 22,000-line extension to the Tehran telephone system is adequate for the period of the Seven Year Plan, and recommend provision for an additional 5,000 lines. The local facilities in the remainder of the country are totally inadequate and we recommend the installation of 50,000 lines of automatic central office equipment distributed among the principal cities. All magneto switchboards should be replaced in the smaller cities.

Unfortunately, the Seven Year Plan does not provide for the expansion of local telephone facilities, which we believe is a mistake. The Plan allots Rls. 500,000,000 to telecommunications. As our estimate of the cost of developing telecommunications other than local telephone plant is Rls. 270,000,000, there is available within the Plan budget Rls. 230,000,000 for local plant, which would be sufficient to provide about 23,400 lines of the required 50,000 lines, and we recommend that this amount be made available for this purpose. The remaining requirement of 26,600 lines should be financed by the Telephone Company. We estimate that additional funds in the amount of Rls. 300,000,000 are necessary to rehabilitate existing worn-out magneto plants. This expenditure also should be financed by the Telephone Company. The long-distance telegraph and telephone services should be derived from the same basic circuit facilities through consolidation of all pole and wire radio facilities. In addition, as a temporary expedient, the following cities and Tehran should be linked by a radio network: Ahwaz, Tabriz, Shiraz, Kerman, Zahidan, Meshed, Yezd, Sanandaj, Isfahan, Hamadan, Resht and Gurgan.

We recommend that new radiotelephone service needs be met by the installation of high power, single sideband, three voice channel transmitting facilities, together with associated receiver and antenna accessories. We believe that existing equipment will meet the international telegraph requirements for the period of the Plan.

We do not consider the present broadcast facilities adequate for the public interest, and we believe that the following improvement program is feasible and is technically and economically sound for supplying broadcast needs:

Establish in Tehran a new high power short-wave station and a 50,000-watt medium-wave station, together with new studios.

Establish 1,000-watt medium-wave broadcast transmitters and studio facilities in Ahwaz, Tabriz, Shiraz, Kerman, Zahidan, Meshed, Yezd, Sanandaj, Isfahan, Hamadan, Resht, and Gurgan.

Install the three 100-watt broadcast transmitters purchased before the war, together with studio facilities, in Bushire, Kermanshah and Rezaiyeh.

We recommend the establishment of marine radio stations of 300-500 watts power at Khorram-shahr, Bandar Shahpur, Bushire, and Bandarshah.

There is urgent need for the training of engineering and operating personnel in the use of modern equipment and in operating techniques. For this work, and to provide the experience needed for the development and extension of the communications system, advisory service will be required from foreign experts.

We recommend that schools and laboratories be established in collaboration with existing educational institutions; new buildings need not be constructed for these activities. A new building, however, should be constructed in Tehran to provide a new telegraph central operating headquarters. The proposed new administration building for the Ministry of Posts, Telegraphs and Telephones should be financed out of the normal budgetary appropriations and not by the Seven Year Plan.

Summary of the recommended allocations of Plan funds for the communications program is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ years	Total
Domestic	5,845	33,608	164,842	204,295
Foreign exchange	5,079	55,706	245,899	306,684
Total	10,924	89,314	410,741	510,979

INDUSTRY AND MINING

Except for the large development of the Anglo-Iranian Oil Company, Iran's capacity for manufacturing is very limited and the nation is extremely dependent upon imports for necessities. Such industrial development as has occurred began early in the reign of Reza Shah Pahlevi and reached its peak in the period from 1309 to 1319 (1930 to 1940). It consists primarily of some textile mills, beet sugar refineries, brick kilns, a cement plant, some relatively small mining operations, Army munitions plants, a few simple chemical plants, small food processing operations and small factories producing a variety of consumer goods. Development was pushed with vigor with the aid of foreign echnical experts and, considering the almost complete lack of technical knowledge and kill among Iranians, commendable progress was made. Many of the new enterprises were established and managed by agencies of the Government. With the advent of World War II, expansion ceased and most of the foreign technicians left the country.

During the war and the immediate postwar years, when there was a worldwide hortage of goods of all kinds, Iranian plants were operated at near capacity and, as epair parts for foreign-made machines were not available, the condition of the plants eteriorated. This was aggravated by the fact that management has not yet learned that ood maintenance is essential for continuous operation of plants at full capacity. We ound that almost all industrial plants and mines which we inspected are in very poor ndition; many factories are unable to operate at full capacity and many machines are lle. The efficiency of those which are in operation is low.

An unfortunate result of high earnings made during the war and postwar years as that management became lax. In privately-owned industries, most, if not all, of the rofits were paid out as dividends, working capital was depleted, and funds for rehabilitaon of plants and purchase of parts were not accumulated. Accounting practices are rimitive; charges for depreciation are virtually unknown and, where applied, are indequate. There is little appreciation of the importance of accurate accounting and atistical information and of the contribution it can make toward profitable operation.

Control of Government-owned industries is centralized in the Industrial and Mining ank in Tehran. The number of bank employees concerned with management of the plants large and operating methods are cumbersome and inefficient. In almost all plants and ines visited, both Government and privately owned, there are far too many employees. bor discipline is lax, and per capita output is very low.

Within the past 18 months economic conditions have changed greatly. Foreign-made goods, particularly cotton textiles and glassware, have been imported in large volume and at low prices. Export markets for such products as rugs and hides, and domestic markets for most products, have shrunk. We find Iranian industry in critically poor condition to meet this changed situation.

We are strongly of the opinion that the Government should take steps to rid itself of its various industrial enterprises by transferring them to private ownership. It may be necessary for the Government to assist purchasers by advancing money on secured loans, by purchasing preferred stock, or even by forming joint stock companies in which the Government would retain a minority interest. We see no need to sell the properties at sacrifice prices but, on the other hand, prices should not be so high that a fair return on the investment cannot be earned by the purchaser. All transactions should be approved by the Plan Organization.

If Iranian industry is to prosper, it must be able to produce goods comparable in quality and price with imported goods. While expansion is desirable and necessary, the first and most urgent need is for prompt rehabilitation of existing plants in order to increase production with the least possible delay.

Since transportation is difficult it is important that care be taken in selecting locations for new or expanded industries. We believe, for instance, that instead of concentrating a large proportion of the cotton textile industry near Tehran it should be developed on a decentralized basis in keeping with the potentialities and needs of various sections of the country, bearing in mind such factors as nearness to markets and raw materials, labor supply, and availability of power and water. We are likewise of the opinion that expansion of the cement industry should not be begun by increasing the capacity of the present plant near Tehran but by the construction of small plants elsewhere. The Tehran plant, however, should be rehabilitated without delay and its original capacity restored.

Although the geological structure of most of Iran is of a type favorable for the occurrence of coal, oil and other minerals, little is known about it except for oil areas operated by the Anglo-Iranian Oil Company. It has not been systematically surveyed and no reliable data are available as to the full extent and quality of the deposits. We recommend that geological and topographical surveys be made to determine the extent and quality of known deposits and, where necessary, that samples be sent abroad for analysis.

We believe that a systematic search for minerals should be made and, in the full report we have outlined a few simple methods whereby this can be done at little cost. We believe that opportunities may exist for the development of profitable export business in minerals, particularly sulphur and salt.

We found that all of the mines examined were poorly equipped and inefficiently operated. Many of them are in a very poor state of repair. We have made recommendations as to the steps to be taken at all of the principal mines to put them in good operating conditions and to reduce costs. It should be borne in mind, however, that in many instances such recommendations are made subject to the favorable result of surveys which would determine the extent and quality of the individual deposits, the possibility of their being worked economically, and the extent of the market for the products.

Iran's timber reserves are wastefully exploited as is pointed out in the agricultural section of this report. A contributing factor is the inefficient use of mine timbers. In all the mines visited, far too much timber was being used and in many instances the individual bers were too small. Arrangements between the Ministry of Agriculture and mine erators should be made whereby the wastage of valuable timber can be minimized.

The iron mines at Semnan and elsewhere were developed primarily to supply ore a proposed steel mill to be built at Karaj. The mill was not constructed because of the r. We do not think that the construction of this mill would be economically sound, but do think that a study should be made without delay to determine the feasibility of erect- a small blast furnace of say, 100 to 150 tons daily capacity, together with a foundry for manufacture of cast iron pipe and other castings at the site at Karaj. This study uld be carried out by a competent foreign specialist not affiliated with any manufac- er of equipment.

Steps should be taken to simplify the methods of operation of Government-owned ustries by the Industrial and Mining Bank. We recommend especially that Government nts be relieved of the necessity of employing excess personnel, and that the regulations ich impose on privately-owned enterprises the necessity of keeping more people on their rolls than are needed be rescinded.

The work of rehabilitation of the present Iranian industries and of creating new ustries will be difficult. It cannot be done quickly, nor can it be achieved without assist- e from foreign technicians and engineers. Continued and wholehearted co-operation ween Government and private industry and the elmination of unsound restrictions practices are vital.

Iran has many resources, and many useful raw materials; above all it has a large ply of hard-working, intelligent labor. If this labor is trained in the use of modern ductive equipment, and is provided with such equipment, there is every reason to eve that a sound industrial economy can be established.

Summary of the recommended allocations of Plan funds for the industry and mining gram is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ Years	Total
Textiles	23,675	67,150	103,350	194,175
Cement	62,500	102,500	270,000	435,000
Other construction material	6,860	10,680	7,660	25,200
Army munitions	15,650	17,000	48,350	81,000
Sugar	229,000	132,000	521,000	882,000
Dried fruit packing	2,400	1,200	2,400	6,000
Chemical industries	9,950	35,500	204,550	250,000
Mining	59,561	71,263	68,240	199,064
Iron and steel	800	28,000	102,000	130,800
Total	410,396	465,293	1,327,550	2,203,239
Portion of above required for foreign exchange	230,392	244,849	729,448	1,204,689

ELECTRIC POWER

The use of electric energy in Iran has been very small even when compared with use in some nearby countries comparable as to climate and as to degree of indus- lization and urbanization. The installed capacity of existing facilities is inadequate even for present needs. For the most part they are of obsolete type and, largely because of inability to procure new equipment and replacement parts during and since the war, they are in poor condition. Shortage of electric power is an important obstacle to obtaining full production from existing plants and to the expansion of industrial capacity. The inadequacy of service in urban areas is a national handicap in terms of health, efficiency, and convenience of the people.

According to the incomplete information available it would appear that the present installed capacity of electric generating plants in Iran is about 90,000 kw, of which about 70 per cent is in industrial plants and the railroad and about 30 per cent in utility plants. About half of the latter is in Tehran.

In the 34 major cities there would appear to be a total capacity installed, under construction or covered by firm commitments, of about 75,000 kw. This figure does not include the power facilities of the Anglo-Iranian Oil Company.

Our report on the electric power situation is included in Volume IV. This report is concerned primarily with the development of a program for central power stations for the principal cities of Iran. It is expected that these central stations, in addition to being the source of supply for general distribution in the cities, will supply the power requirements of most new factories and industrial establishments in or near the cities, and of such irrigation pumping as may be located nearby. Only incidental consideration is given to integral power facilities to be installed in factories, to power installations for irrigation pumping beyond the reach of electric lines from the central stations, and to power stations for small cities and villages. No consideration is given to power supply for the Anglo-Iranian Oil Company properties or for the cities receiving their power supply therefrom.

The prospective requirements for power for the implementation of the Plan, while not large in comparison with those of most western countries, represent a large increase in relation to present capacity. To meet these requirements and to make good existing deficiencies call for a program which will be difficult.

The program which we recommend calls for the installation of approximately 220,000 kw of generating capacity, about 55 per cent of which would be steam-generated and the remainder diesel-generated. We recommend, however, that immediate investigation be made of the possibilities of developing water power, particularly from the snow-fed streams of the Elborz mountains and possibly in other locations. We believe such investigations could be completed in about a year excepting precise determination of minimum stream flows, but if this determination can be made within reasonable accuracy, decision as to proceeding with development can be made and plans started. To the extent that water power can be economically utilized, the steam and diesel generating program may be modified.

The procurement of the necessary generating equipment will take time. As a means of speeding up deliveries we recommend that orders be placed immediately for a number of diesel units of size known to be needed, a list of which is given in the full report. Also, to relieve temporary shortages of power, we recommend the immediate ordering of at least two mobile diesel power plants, mounted on railroad cars, which could be moved to any desired location.

We estimate the total cost of the program which we recommend at Rls. 2,078,470,000; an additional sum of about the same order of magnitude would be needed for distribution cilities. For the latter we have suggested no allocation of Plan funds as we assume the st will be met from Government loans or by other means.

Of the estimated cost of the program set forth above about Rls. 1,384,930,000 would required for foreign exchange. We suggest that the amount of aid from the Plan to be de available for this be Rls. 1,013,010,000 of which Rls. 1,009,460,000 would be in foreign change. Summary of the recommended allocations of Plan funds for the electric power ogram is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ years	Total
Central station program:				
Public service	11,580	30,880	224,080	266,540
Industrial use	28,720	73,190	628,420	730,330
Special projects	9,200	6,940	—	16,140
Total	49,500	111,010	852,500	1,013,010
Portion of above required for foreign exchange	47,200	109,760	852,500	1,009,460

PETROLEUM

For policy reasons the Government has decided that a concession for oil explora- n and development should be granted to a Government-owned company, covering the ire country except the area already under concession. The Seven Year Plan Act pro- es for the creation of a joint stock company for this purpose, and envisages that the pany may undertake additional activities including the refining, transporting, and rketing of oil. In the Plan Act Rls. 1,000,000,000 have been allotted for its capitalization.

In the petroleum section of our report we have discussed the subject at length. We mmarize hereunder our more important recommendations stated with their respective es in Volume IV:

> A Government-owned joint stock company should be incorporated under the commercial code of Iran with a form of charter approved by the foreign consultants engaged to assist in the implementation of the Plan, who would also advise as to the qualifications of the Iranians to be appointed as directors, managers, and technicians. The consultants would also assist in securing personnel and setting up the operating organization.
>
> A law should be prepared and submitted for legislative action in the form suggested in our main report for conveying concessional and other necessary rights to the company.
>
> A program for exploration should be undertaken. It should include study of existing information, topographical and geological surveys, and such geophysical surveys and core and structure drilling as may be warranted. The program should follow the principles discussed and the general procedure recommended in the main section of our report. It should be directed by the chief geologist under the general management of the company.
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> A careful and continued study, aimed at improving distribution and marketing of oil products throughout the country, should be undertaken. This matter is discussed at length in the distribution section (Vol. V) of this report. The primary object of this part of the program should be to provide Iranians, especially the poorer classes, with low cost fuel and means for utilizing it. This would be an important step in reducing the destructive use of forest and plant resources.

The economics of oil and gas distribution by pipe line from existing and potential new oil fields should be studied in relation to the programs for industrial development, municipal improvement, and the growing transportation systems of the country, as they progress. It is impossible to evaluate at present any particular system of long distance pipe line transportation of oil or gas, but the availability of these sources of heat and power may be a very important factor in determining other parts of the long range program. Study of pipe line systems from both existing and potential sources of supply, therefore, should be begun at once and co-ordinated with studies of other projects which are dependent upon the availability and cost of fuel in large quantities.

At least one well qualified Iranian should be selected by the Plan Organization for intensive training in the United States in the field practices which will be best suited for the work in Iran during the stages following the preliminary surveys. The purpose of this is to enable continuation of the general oil program at the proper time with Iranians in responsible positions and to minimize the necessity for foreign experts in later developments.

Summary of the recommended allocations of Plan funds for the petroleum program is as follows:

	In Thousands of Rials			
	1328 Second Half	1329	Remaining 5½ years	Total
Domestic	12,000	36,000	350,000	398,000
Foreign exchange	8,125	24,375	325,000	357,500
Total	20,125	60,375	675,000	755,500

ORGANIZATION

Much of the success of the proposed program for social and economic reform will depend upon the organization which is established for its administration and execution.

While technical skill, financial and other resources, and a general sense of freedom in the exercise of individual initiative, have had much to do with the development of a prosperous economy in all industrialized countries, no single factor has been as important as the evolution in the art of management, which has made possible the effective co-ordination of all the other elements.

The administrative problems which face those responsible for the Seven Year Plan are difficult. To expect a successful outcome of this Plan it is necessary to presuppose an organization in which each person and agency is placed in correct relationship with each other one and with persons and agencies outside the Plan Organization itself. Each essential function must be defined and correctly allocated. Procedures must be fixed to connect these separate functions in such a way that the cumulative power of the organization is directed toward the designated objectives. Responsibilities, and related authorities, must be explicity defined and assigned in order to energize and control the entire administrative mechanism.

It should be possible to create such an organization in Iran just as it has been elsewhere. It cannot be done quickly, but if undertaken properly it can be done rapidly enough to permit the Plan to advance as fast as other limiting conditions will permit.

If an effective organization is to be established it will be necessary to set aside many considerations which are irrelevant to the success of the Plan, however important convenient they may appear from other points of view. The selection and appointment personnel for the key positions is one of the vital points in the creation of the organi- ion. The structural form of the organization, the arrangements made for decentraliza- n, the definition and assignment of functions, responsibilities and authority, must all approached with the sole aim of creating the most effective means of executing the ectives of the Plan. Otherwise it can be expected to fail.

Broadly speaking, we envisage the Plan Organization as consisting basically of three agencies established by the law (High Council, Managing Director, and Board Control) with a fixed staff of Iranians under them, appropriate in qualification and mber to perform or supervise the functions of the Plan which can be expected to con- ue throughout the seven year period. To this basic organization can be added from e to time, and for whatever period is necessary in each case, qualified personnel trans- rred from other Government institutions into the Plan Organization for the purpose collaborating in the preparation of particular projects or parts of the Plan program. rmally, men thus utilized in the preparation of projects should accompany the project, n approved, through its execution stage in whatever agency it is placed for implemen- on. Through such an arrangement the permanent personnel of the Plan Organization lf would be kept at a minimum, the fullest possible use could be made of all specially lified men in all Government departments, and the agency having final responsibility the operation of the completed project would have all the advantages which come n the participation of its own men in the preparation of the Plan projects.

We envisage also, however, that deficiencies will be disclosed at all levels of the nization, in experience and special skills which are required for the successful opera- of the Plan. These may be remedied in several ways.

On the lower level of actual execution of Plan works, a deficiency will exist in the des of foremen and of semi-skilled and skilled artisans. This should be made up by ring qualified men from abroad who will train Iranians in these grades. On higher ls deficiences will exist, particularly in experience, in the ranks of technical men and ned executives. These deficiencies likewise should be remedied by employing directly the organization concerned qualified men from abroad. Here again, Iranians will ive the additional training which is essential to the continuing success of the program. he highest level the Managing Director and the High Council will find it advantageous ave close to them a body of foreign expert consultants upon whom they can call both guidance in technical or other matters and for arranging for whatever other services needed from the more technically advanced and more highly industrialized countries e world.

In addition to the deficiencies in personnel there are others less readily recognizable equally important. Chief among these is the lack of definite arrangement for bridging gap between the Plan Organization and the established institutions of the Government. re are also deficiencies in the existing means of executing the projects formulated by Plan Organization. These are of many kinds and each one must be remedied appro- tely. In some cases existing agencies can be used effectively as they are; in others they t be strengthened or modified; in others new agencies must be created and at the proper transferred to the appropriate permanent establishment.

Much of the work necessary under the Plan will be performed by private enter- s, and the Plan Organization must relate its activities with those of the private in- ors and operators of the country. Among these are the Iranian contractors who must be developed as one important means of executing Plan works. Among them also are the companies and contractors from abroad who should have important parts to take in the program.

One other broad field of problems that the Plan Organization must be prepared to recognize is the effect which the diverse activities of the Plan will have on the economy of the country.

The foregoing brief comments will make clear our reasons for recommending that the Plan Organization proceed with the utmost care in establishing the organization upon which the success of the Plan so largely depends.

In the organization section of our report (Vol. V) we have reviewed briefly certain principles of effective organization which are important in approaching this part of Iran's problems, for the reason that the concepts of administrative procedure as developed in western countries, and particularly in America, are quite different from those prevalent in Iran. Unless the new type of thinking which is represented in the proposed objectives of the Plan is instilled also in the organization which must execute those projects, the Plan might easily fail through non-performance.

Having discussed these principles, we describe in the main body of the report the actual organization which we recommend. This is done in two chapters, the first describing the form of organization to show the various agencies which should be provided, including regional or ostan centers for decentralization; and the second describing the functions which must be performed in order to achieve the purposes of the Plan. Emphasis is placed upon the explicit definition of essential functions and of the responsibilities and authorities which must be fixed throughout the organization to insure effective execution of the program.

While the entire section on organization is implicitly a recommendation for adoption by the Plan Organization, there are a few points which warrant special attention at the outset of the program. These may be summarized as follows:

1. The first step toward creating the organization discussed here should be the establishment of a salary scale embracing all the key positions in the proposed organization. Until this is done it will be impossible, for practical reasons, to determine the availability of many well-qualified men who are now bearing personal as well as professional or official responsibilities elsewhere. The amount of the salary must be to some extent a matter of Plan Organization policy, but if men of the proper qualifications are to be procured their compensation must be sufficient to attract and hold them. With this in mind we recommend that the salary scale be made generally equal to that of the Anglo-Iranian Oil Company for its Iranian employees.
2. The second step toward creating the organization should be the selection, employment and tentative assignment of the best-qualified men available, as managers of the departments. It is especially emphasized that we do not recommend the appointment of men to fill the three positions described as directors in this organization, until a later stage in its development when such appointments can be made with greater certainty of judgment. The personal and professional qualities which are necessary for successful performance in the Plan Organization described here are quite different from those which may have determined the previous rank and title of men in other organizations.
3. It is assumed that the Plan Administration will arrange for the services of consultants, who should advise each manager in determining what

foreign specialists will be required in the several divisions to assist in organizational work and to meet the early requirements of the Plan program. The earlier such specialists can be decided upon and secured (with the aid of the consultants in making the individual selections), the greater the assurance that the organization will be properly formed and directed.

4. Once the first steps have been taken to form the organization there is no single function more importantly needed than that of analyzing personnel requirements and availability. The Personnel Department should be afforded every facility for its effective operation. Both the problem of securing qualified men for the Plan Organization itself, and the problem of putting into productive employment the many thousands of Government employees now carried on the payroll, will demand the fullest efforts of the Personnel Department.

5. From the standpoint of administration, the Seven Year Plan Act is unsatisfactory both because it fails to make its intentions clear in several important particulars and because certain explicit provisions present difficulties of practical execution. We believe, however, that the general intent of the law is clear enough and that time should be afforded the High Council, Managing Director and Board of Control to restudy its provisions and propose amendments in the light of practical needs and current developments. We recommend that no such revision be proposed for the action of the Majless until our report and the organizational, financial and technical problems which face the Plan Organization have been studied carefully. This should provide a basis for revisions which will accomplish the necessary purpose. Meanwhile it will be necessary for the Plan administrative agencies created by the law to adopt a working agreement and allocate authority among them which permits a practical and effective organization to be formed.

During our study of this organizational problem we have been met many times the hesitant opinion that what works well in some of the western countries may not k at all well in Iran. We have repeatedly been told that Iranian customs and tem- ment will not permit certain types of administrative procedure which we believe are ntial to the success of the Plan.

We have taken the position that, if Iran is resolute in its determination to achieve aims of the Seven Year Plan, it must adopt methods which have been tried and ed elsewhere. We are convinced that, given necessary guidance and training, Iranians do what anyone else can do, and we have accepted no counsels of despair.

In line with this reasoning we recommend that wherever the basic administrative edure which we have outlined here appears to be unsuited to individual temperaments rrent practices, the first effort toward adjustment would be to change the tempera- or current practice, and not the recommended organization. Changes in principle, h could be made by their advocates to appear inconsequential, might easily deflect course of the Plan toward the practices which have inhibited social and economic ncement in Iran for many generations.

STATISTICAL ORGANIZATION

Accurate statistical data are essential for the planning and execution of an eco- ic development scheme; in particular, detailed information is necessary on climate hydrological matters, population, health, labor supply, crops, utilization of land, strial production, power, transportation facilities, prices and finance. Indeed, so much is this the case that the building up of a statistical organization should, in fact, commence some years before actual planning; and it was with this in mind that the Iranian Government invited Dr. John Murray, a distinguished statistical specialist, to start work on the reorganization of statistics some time prior to the engagement of OCI.

In the course of his five months' visit early in 1327 and in three subsequent visits, an examination had been made of all Government offices which either have or should have statistics, and certain interim reports have been made. After the engagement of OCI it was decided that Dr. Murray's survey should be incorporated into this report and the British Government authorized Dr. Murray to make his study available for that purpose.

His examination covered the Bureau of Research and Statistics, previously forming part of the Ministry of Finance and now attached to the Plan Organization; the census, civil registration and other statistics of the Ministry of the Interior; and the Ministries of Health, Labor, Agriculture, National Economy, Finance, Education, Justice, and Roads and Communications. A special investigation was made of the Customs Statistical Bureau and of the principal sources of its figures at the customs post at Khorramshahr. Outside the Ministries proper an examination was made of the statistics of the Bank Melli, the Industrial and Mining Bank, the Tobacco Monopoly and the Iranian State Railways. Since it was clear that the figures maintained by the Ministries did not always represent exactly the situation in the provinces, two ostan headquarters (Isfahan and Mazandaran) were visited, as well as a number of other Government offices outside Tehran.

This detailed examination and the experience of all the consultants combine to show that Iranian Governmental statistics suffer from certain faults:

> Certain essential figures of major importance are wholly or partly lacking; for example, population census, climatic, public utility and forestry data, production and accounting statistics of Government and private factories.
>
> Despite these gaps the Government as a whole suffers from an excess of duplicated inaccurate statistics; for example, there are several sources for agricultural figures, none very trustworthy.
>
> A strong central statistical organization is lacking.
>
> There is a tendency to attempt nationwide complete counts in matters in which sample studies or concentration on accuracy and completeness in a limited field would be more profitable.

We recommend the creation of a permanent central statistical bureau and the early preparation of statistics in certain fields necessary for the Plan Organization itself.

The first priorities on statistical planning must, therefore, be: laying the foundations of an organization; commencement of collection of meteorological data; derivation of statistics of industrial production and, in particular, of Government factories; improvement of statistics of the labor force; the build-up of the census organization; and the improvement of those statistics on which only a small amount of action is required. A second, but high, priority should be accorded to the reorganization of agricultural statistics, particularly to those relating to crop estimates; public health statistics; revision of economic indicators such as cost-of-living index; the taking of the census; and the development of a central statistical organization. In the third priority falls the build-up of the remainder of the statistical organization throughout the Government and the utilization of this machine for the production of more accurate long-term statistics.

Immediate action should be taken in regard to certain matters falling within the first and second priorities as set out above. The specific projects recommended are listed elow and an estimate has been made of the amount of money in rials required locally nd the amount of foreign exchange necessary to carry them out. In making these estimates it has been assumed that:

When no new expenditure is involved, but only the reorganization of an existing statistical section, the charge will be as now on the revenue of the Ministry concerned; and

When special new costs are involved the charges will be against that part of the Seven Year Plan budget devoted to the particular field concerned.

A strong Central Statistical Bureau is a vital necessity, and the following steps hould be taken towards its creation:

A law of statistics should be passed, setting up a Central Statistical Bureau on the nucleus of the present statistical office of the Plan Organization and granting to it:

a. Technical supervisory power over the whole Governmental statistical machine, the existing Council of Statistics being used as part of the mechanism of co-ordination;

b. Power to collect from departments, private individuals, institutions or corporations, statistical data in all fields either direct or through the agency of ministerial statistical sections.

To secure the authority to order an installation of punched-card machines to provide a center for the analysis of basic data beyond the capacity of Ministries. The order must be placed early to allow for delays in delivery.

Selection and appointment of a foreign supervisor for the punched-card installation.

Appointment of a foreign adviser on statistical organization, to supervise and assist the application of the whole plan for statistical reorganization throughout the Government (a short-term post).

Appointment of a foreign adviser to the Central Statistical Bureau.

Purchase of office equipment on advice of the above.

Selection of Iranian staff and build-up of Central Statistical Bureau, which should await, however, the appointment of the foreign advisers on statistical organization and for the Central Statistical Bureau.

Recommendations relating to a cartographic survey and to climatic statistics are ontained in the statistical organization section (Vol. V). We wish to emphasize the rgency of setting up a separate meteorological department and of transferring to it the limatic statistics at present maintained in the Ministry of Agriculture. The cost of this epartment does not fall against statistical funds. It should from the outset pass climatic tatistics to the Central Statistical Bureau.

The following immediate steps are recommended towards the building up of an ornization for the taking of the population census, possibly in 1329.

Appointment of a foreign adviser.

Secure authority to order a punched-card machine installation; details are contained in the full report. The machines must be ordered early owing to delays in delivery.

Continuation of mapping preparations for census.

Delegation of members of census organization staff to study census methods in other countries.

Expansion of the census organization and other census preparations.

Recommendations for detailed improvements of public health statistics, mainly in technique, are included covering the present work of the Ministry of Health Statistical Department. An adequately trained biostatistician, who must at first be a foreigner, should be appointed. He will be responsible for research in medical statistics, will have supervisory control over the section and will assist in a training program for Iranian biostatisticians.

The collection of housing statistics will be a matter for the proposed Housing Authority and are not covered in this part of the report.

Refinements are recommended in form and procedure for the collection of labor statistics as well as their collection in a central statistical section of the Ministry of Labor.

The following steps are recommended for the improvement of agriculture statistics:

Selection and appointment of a foreign agricultural statistician, with training in sampling techniques and their application (preferably American in view of the experience required).

Study and planning of a crop estimating organization within the Ministry of Agriculture which will employ sampling techniques, and the creation of which will be the first task of the above officer. In the first year he can obtain preliminary estimates from the extension service agents sent around the country by the experimental stations.

Until the above officer has had time to study the needs, layout and possibilities of an agricultural statistical organization, no change should be made in the present statistical section of the Ministry of Agriculture; but the specialist will work within the framework of this section and will study it with a view to reorganization as the one agricultural statistical section in the Ministry, the crop estimating organization being a part of it.

Efforts to take an agricultural census should be deferred for two or three years.

Forestry and climatic statistics should be transferred from the Ministry of Agriculture statistical section to the appropriate departments.

The following recommendations are made for improvement in statistics of industrial production:

Application of the forms prepared by the Industrial and Mining Bank to all factories under Government control, with some simplifications which should produce reasonably complete statistics in this field.

Appointment of a foreign specialist in industrial statistics in preparation for centralizing all statistics of industry.

Planning and design of a census of industrial production to be taken in 1329.

We recommend that the Customs statistical section order at once an installation of punched-card machines. This is not chargeable to the Seven Year Plan, but its installation forms a part of the general scheme for statistics.

The following steps are recommended in the statistics of the Bank Melli:

Commencement of studies for the compilation of two new wholesale price indices.

Commencement of a budget study for recalculation of cost-of-living index.

The costs of the above are not allocable to the Seven Year Plan, but the recommendations form part of the general statistical scheme.

Summary of the recommended allocations of Plan funds for the statistical organization program is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ years	Total
Domestic	8,725	16,925	79,508	105,158
Foreign exchange	2,375	4,360	11,400	18,135
Total	11,100	21,285	90,908	123,293

DISTRIBUTION

A nation benefits from increasing the output of its agriculture, mines, and factories only to the degree to which its distribution system can effect the transfer of goods from producers to consumers cheaply and efficiently. Our study of the methods of distribution followed in Iran was made for the purpose of enabling us to recommend policies and programs which would contribute to the accomplishment of the Plan's broad objectives, and of indicating as specifically as possible how these recommendations might be implemented by the Plan Organization.

The form and workings of a nation's distribution system are conditioned by its geography, economy, and society. This is particularly true of Iran. Its large size, relatively small population, widely separated cities, and rugged terrain impose a more than ordinary burden upon transport; hence transportation charges, even with efficient facilities, will always tend to be high and to add materially to distribution costs. A balanced regional development of the economy and, where practicable, the dispersion of industry in major market areas not only should produce a better national economy, but should contribute to the development of a sound distribution structure and lowered distribution costs.

The feudal nature of Iran's agricultural economy immobilizes much of the national product in that it is consumed where produced. It results in small marketable surpluses which leave the nation perpetually on the brink of food shortages, and gives the economy a "barter" complexion which, combined with the low earning power of peasants, places them at the mercy of the village shopkeeper and itinerant peddler. Moreover, the low man-hour productivity of both agriculture and industry tends to keep wages so low as o impede seriously the development of widespread mass purchasing power upon which n expanding economy and a vigorous, efficient distribution system so largely depend. ncreased production and availability of essential consumers' goods are necessary to overome these difficulties.

Iran's distribution system is almost entirely undeveloped, reflecting the generally ndeveloped state of the economy and the small per capita volume of goods available to e consumed. There is great need for more and better storage and processing facilities nd for the general application of standardization, grading, and sanitation, and for better ackaging of agricultural products, especially those moving into export trade. Better redit facilities are needed to reduce the burden which exorbitant interest rates place pon distribution and prices. Accurate information and statistics with respect to both omestic and foreign markets and trade are lacking; such information should be prepared nd widely disseminated as an aid to orderly distribution and the selection of markets.

The flow of distribution is usually from the manufacturer or importer to the tailer, although various forms of broker are active in the agricultural field. There may be too many speculators in Iran, but it is evident that there are too few intermediaries performing normal wholesale functions. Partly because of poor transportation and communications, and partly because of excessively detailed and constantly changing Government regulations with respect to both foreign and domestic trade, most of the wholesaling and importing is concentrated in Tehran, with the result that the remainder of the country is lacking in adequate channels of distribution. Finally, the bazaar's small-scale, tightly knit distribution operations are in large measure unsuited to the development of modern scientific distribution, but the changing of this situation must be a matter of gradual evolution.

Distribution practices are unscientific and frequently undesirable. Sellers seek to make the maximum profit upon each individual transaction rather than to increase their total sales and, therefore, their total profits by lowered prices which will move their goods more rapidly and in larger volume for the same capital investment. Adulteration of quality is common, especially in agricultural products, and there is a widespread tendency toward joint action to control prices and to limit competition territorially within a community.

The activities of Government have not been helpful in encouraging the development of a vigorous, efficient distribution system. The methods of distribution of the products of Government factories and enterprises through the Industrial and Mining Bank are inefficient. Government monopolies have shown only limited efficiency with respect to the physical movement of goods, and little or no enterprise in securing maximum profits by lowering prices, thereby increasing the volume of sales.

There is grave question as to whether the present system of distributing Government wheat and bread accomplishes its fundamental purpose of ensuring a constant supply of cheap bread to poorer city dwellers. The system encourages growers to seek to have their quotas reduced and to hoard supplies. It fosters the adulteration of Government wheat and bread, and increases price and supply fluctuations. It should be the goal of Government materially to increase its grain carry-over to eliminate shortages. It should encourage greater grain production. The present distinction between Government and free market wheat and bread should ultimately be abandoned. We realize that this is a highly complex problem which will require careful study and experimentation before practical solutions can be evolved, and it is one which, because of its social and economic implications, must be approached soundly even at the expense of speed.

Petroleum comprises Iran's most important single natural resource. Kerosene seemingly is the principal hope of replacing the use of charcoal and shrubs which today is denuding Iran's forest and plant cover and seriously threatening its future water supply. Gasoline will become increasingly important as transportation facilities are extended, and heavy petroleum fuels are important as a source of power. The cost of distributing petroleum products is inordinately high. Transportation costs and taxes each amount to approximately 43 per cent of the retail price. Petroleum products are sold in Azarbaijan, eastern Khorassan, Kerman and Baluchistan in 18-liter cans because the condition of the roads and port facilities is such as to preclude distribution in bulk. The cost of packaged petroleum products is more than double that of products distributed in bulk. In view of the importance of petroleum products to the future of Iran, it is to be hoped that with improved transportation facilities, package distribution, at least to urban centers, can be eliminated.

We recommend also that investigations be made to determine the best means of effecting cheap distribution of kerosene to the villages. To encourage the use of kerosene for cooking and heating purposes, a considerable amount of educational work will be necessary. Low cost stoves and other equipment must be made available. We recommend that the development of a distribution plan for this purpose be made a project of the Plan Organization in conjunction with the proposed Iranian Petroleum Company and, at an appropriate time, with the Anglo-Iranian Oil Company. Consideration should be given also to increasing the use of petroleum fuels in commercial establishments such as bakeries and baths and in industry as soon as distribution facilities are capable of meeting demand.

Co-operatives would seem to be well suited to a number of agricultural undertakings such as the rental of land and water, purchase and rental of farm equipment, purchase of supplies, and the financing of equipment purchases. Joint efforts with respect o harvesting, grading, processing and packaging, and marketing also may be undertaken vith advantage. In the case of urban communities, the principal usefulness of co-operaives lies in the purchasing of essential consumer goods. Co-operatives must result from oluntary effort, have capable leadership, and the participation of groups of people accusomed to working together. We recommend that the development of co-operatives along hese lines be made a project of the Plan Organization, but the development work be irected toward the establishment of a sound foundation for future growth before extenive efforts are put forth.

The export trade of Iran has been declining slightly in recent years, both in tonnage nd value. Perhaps more important is the fact that it has undergone a complete reorientaion. Germany and Russia, formerly among the country's most important customers, no onger purchase Iranian goods in any quantity, while other nations, such as the United States, Great Britain, and India, have become more important. Foreign demand for Persian rugs has seriously declined, perhaps permanently. Iran's second most important xport trade, dried fruits and nuts, is handicapped by a lack of proper grading, standrdization, and sanitation, defects which are common to all of Iran's agricultural exports. Steps should be taken to correct these conditions.

The agricultural products of northern Iran travel great distances to reach world arkets, and transportation is costly and slow. It would be highly advantageous if a nore direct route to the Mediterranean could be developed than that through the Persian Gulf ports. Transit privileges should be sought either through Turkey to a Black Sea ort or westward to a Mediterranean port, so that these products can reach their markets nore cheaply and rapidly.

Improvement of distribution in Iran will be difficult and will require time. We ecommend that two principal steps be undertaken by the Plan Organization:

To establish a division within the organization charged with conducting studies aimed at improving the general distribution efficiency.

To engage foreign technical advisers to assist in developing the distribution program and such special projects as may be deemed desirable.

Summary of the recommended allocations of Plan funds for the distribution program is as follows:

	In Thousands of Rials			
	1328 Second half	1329	Remaining 5½ Years	Total
Domestic	900	1,700	1,200	3,800
Foreign exchange	1,980	3,800	2,535	8,315
Total	2,880	5,500	3,735	12,115

LEGAL MATTERS

As the Plan develops it will be important not to overburden the statute books with new laws until the need for them is clearly demonstrated. It will be even more important to see to it that as new laws are passed in aid of the Plan adequate machinery is set up for their enforcement.

We outline briefly hereunder certain measures which we believe are important to adapt the Iranian legal system to the needs of the Plan.

> The present laws relating to the acquisition of land and other property by the Government for public purposes are inadequate, and new legislation is needed to give the Government broader powers of property acquisition under proper safeguards of the rights of the individual. Lack of such legislation has resulted in unhealthy land speculation in areas where public projects are under way or where it is believed that they are likely to be inaugurated.
>
> The situation with respect to taxation, both direct and indirect, is long overdue for a thorough overhauling. The return from direct taxes should be increased to permit the reduction of indirect taxes and to fill any gaps in budgetary receipts due to the assignment of revenues to carry out the Plan. The very large proportion of total tax revenues, over 85 per cent, which now comes from indirect taxes tends to increase unduly the cost of living, and too much of the burden falls on those least able to bear it.
>
> The reform of the tax system should include a thorough reorganization of the administrative machinery. A special corps of tax collectors, not dependent for their appointments upon political favors, should be established. They should be carefully chosen and thoroughly trained, and should be sufficiently well paid to remove temptations to accept graft or to favor individual taxpayers.
>
> The municipalities should be given a wider degree of local autonomy. The present project of law on this subject should be carefully reviewed to insure that it grants to the municipalities powers necessary to permit them to cooperate effectively with the Plan Organization and, in general, to carry out their duties as local governments efficiently, particularly in such matters as tax collection.
>
> New legislation will be needed to protect and develop the natural resources of Iran. This is particularly true as regards the development of water resources, irrigation projects, and the protection of forests.
>
> Legislation also should be enacted to cover the right to regulate the equitable distribution of water from rivers as well as from irrigation projects, dams, canals, and the like, resulting from public improvements under the Plan or otherwise. Authority to exercise control should be vested in the Government acting through a Central Water Authority which would replace the Independent Irrigation Corporation. Where water projects are carried out by the

Plan Organization arrangements should be worked out with the Water Authority respecting control during and immediately following the period of construction.

The existing mining law should be revised and amended so as to encourage work of discovery and development. Restrictions regarding exploitation should be eased and the discoverers of new mines, if not the ultimate exploiters of the discoveries, should be more adequately compensated.

The question of land tenure in many of its stages is a practical rather than a legal one, but there is need for legislation to help the peasants acquire untilled and neglected land. The fact that the state is a large landowner should mean that a start in this direction can be made with state lands.

There is need of legislation to encourage the establishment of farm co-operatives. Such co-operatives could assist small farmers in many ways such as establishing a pool of farm machinery and equipment and in the grading and marketing of products. Under proper regulation they could also serve to protect the peasants from the nefarious operations of itinerant and local vendors.

Maladministration is prevalent in most of the Government-operated enterprises. Here the usual checks on management, exercised by an independent Board of Directors, are lacking. While laws alone cannot remedy this condition, certain checks and balances should be provided by statute requiring adequate accounting procedures and reasonable publicity with respect to the current affairs of the enterprise. In the case of projects to be carried out under the Plan through separate corporations or administrations, we recommend the adoption of safeguards such as the following:

> Financial statements certified by an independent accountant should be published semi-annually or annually.
>
> A full report of operations including information on all contracts except routine contracts should be published annually.
>
> No director or administrator should participate in any transaction in which he or any of his relatives has any interest without giving the transaction full publicity.
>
> One or more paid outside persons should be on the Board of Directors or Council of Administrators to protect the interests of the public.
>
> A separate corporation or agency should be established to handle each project of importance or each group of integrated projects.
>
> In the case of projects initiated under the Plan, but carried out by other Government agencies, part of the share capital should be retained by the Plan Organization to give it the right of representation on the Board of Directors or Council of Administrators.

The accounting profession should be given standing under laws adequately prescribing the training and qualifications required of public accountants. One of the existing difficulties in Iran in connection with the operation of business enterprises is the lack of an adequate corps of trained public accountants. The accounts of the Government-owned and of most private corporations are in such condition that it is almost impossible to analyse the financial condition of a company. It is important that facilities for the teaching of modern accounting principles be established. Pending such establishment we suggest that a number of carefully selected students be sent abroad to learn the principles of accounting.

Our study of the legal structure has made it clear that the chief obstacle to be encountered on the legal side in carrying out the Seven Year Plan is not the absence or inadequacy of law. It is the lack of respect for law, and the failures in the administration of law. There are many excellent laws in the statute books which can well be invoked to help carry out the Plan. A large share of these laws, according to the almost universal testimony of persons consulted, are not being adequately administered. Many are quite generally disrespected.

ECONOMIC PROBLEMS

The financing of the Seven Year Plan consists of three major parts. The first of these has to do with the provision of foreign exchange in sufficient amounts to pay for the goods and services which have to be bought abroad. The second part has to do with the provision of the rials which must be spent in Iran for goods and services to be used in the transportation and installation of foreign acquisitions. The third has to do with the regulation of rial expenditures for the Plan so that they will not inflate domestic prices unduly and thereby increase both the cost of the Plan and the cost of living in Iran. The rate at which the rial expenditures can be made without disturbing the domestic price level will set an upper limit for the speed of putting the Plan into effect.

We think that for the present the available foreign exchange balances plus the foreign exchange income from Anglo-Iranian Oil Company royalties and dividends should be sufficient for those foreign purchases which must be made for account of the Plan on the assumption that some arrangement will continue to permit the conversion of the sterling to dollars. We therefore do not believe that the Government will need a substantial loan from the International Bank for Reconstruction and Development, at least in the early stages of the Plan. We believe, however, that one or more relatively small loans on specific projects should be negotiated with the International Bank promptly. Such loans would serve to guide Iran and the Bank in the negotiation of future loans.

The second part of the problem, namely the provision of rials, is much more complicated in its effect on the Iranian economy. The sound and normal way to finance increased domestic expenditures by a government is to drain off currently by taxation or sale of bonds paid for by the public the excess of purchasing power thrown into the hands of the public when the state enters the domestic market as a buyer of goods and services.

We have discussed in the economic section in Volume V of this report other ways in which rials might be provided for the Plan expenditures. These are as follows:

Borrowing rials from the Bank Melli

Borrowing rials from private capitalists in Iran

Devaluing the rial

Reducing the rial note cover reserve requirement

Sale of Government-owned properties, including real estate, to private capitalists

Increasing income from Government-owned factories by more efficient operation

Diverting surplus Government employees from present posts into the Plan Organization

Diverting duplicating or unnecessary expenditures from Ministry budgets into the work of the Plan.

The sale of Government-owned real estate to the public, increased production from
overnment factories, the diversion of surplus employees, and the elimination of dupli-
ting and unnecessary Ministry expenditures into the work of the Plan, are possibilities
r rial provision that will not tend to inflate the Iranian economy, as the rials produced
y them are spent on the Plan program. It is easy for any government to create the media
purchasing power, but it is very difficult to prevent the expenditure of those created
edia from producing serious effects on the price level of the economy. Since payroll
ill undoubtedly be the major item of rial expenditure for the Plan, we are very hopeful
at the non-inflationary contribution to the Plan activities of employee diversions from
resent unproductive work will have great possibilities. Estimates of potential rial avail-
bility from this source should be made immediately, as well as inventories of disposable
overnment properties. Likewise, the possibilities of the elimination of duplicating and
nnecessary Ministry expenditures should be studied.

The third part of the financing of the Seven Year Plan has to do with the control
the rate of rial expenditure. The annual conversion by Anglo-Iranian Oil Company
large and increasing amounts of sterling to rials for domestic running expenses is an
flationary factor in the economy of Iran. The conversion by the Government of royalty
erling to rials to meet ordinary running expenses is also an inflationary factor. These
n be at least partially neutralized by the purchase of consumer goods with the con-
rted sterling and their importation and sale to the public in Iran. Furthermore, the
ven Year Plan, unless strictly controlled, can in itself be a strongly inflationary factor.
therefore must be recognized by those who will control the rate of rial expenditures
r the Plan that they must exercise their controls with due regard to all potentially
flationary factors.

In the full economic section in Volume V of this report, we have outlined and dis-
ssed sound economic principles which we believe should be followed in carrying out
e important work of the Seven Year Plan. We feel strongly that this great program
nnot be successfully carried through by simply superposing it on the economy as it
today. The economic problems are much more fundamental than those related to the
ere getting and spending of money. Unless Iran is willing to face the facts with regard
her surplus Government employees, she is going to increase immensely the problems
Plan financing and of Plan execution, even to the point of prejudicing the success of
e program. Likewise, unless the Government budget can be reduced or tax revenues
creased, any Plan program of the size contemplated will put great strains on the economy.
hese are things which must be faced by Iranians for the good of Iran. With all of these
yet undetermined factors in the Plan program, it is impossible for anyone to state
w much can be spent on the work of the Plan in any given period without adverse effects
the Iranian economy. We are unable to predict how vigorously and aggressively Iran
ill tackle these fundamental matters which we have brought out and upon which the
onomics of the Plan so largely depend.

There is a large problem of organization involved in setting up a working force
accomplish the desired results. The supervisory force must be well planned and com-
tently staffed. We can not too strongly emphasize the necessity of giving the Plan
rganization and Managing Director full power and responsibility to carry out the Plan
ithout interference from, but in co-operation with, existing Government organizations.
urthermore, we believe that every effort must be made to decentralize the control of the
overnment itself and of Government-controlled business. Too much power has been

concentrated in Tehran, and as a consequence competent regional and local administrators have not been developed. We think that the Plan should start modestly, with great attention to the fundamentals which we have pointed out. There would doubtless be political advantages in embarking immediately on large and spectacular projects which would capture the imagination of the public. We do not favor this line of procedure. The parts of the Plan program which will contribute most promptly to the welfare of the Iranian people are not the spectacular ones. To analyze the employment situation, to plan the necessary Government budget surpluses to be devoted to the Plan, to improve the tax structure, to begin with the simple measures which will be fundamentally productive, and to control the rate of expenditures with a watchful eye on the price level are the elements of success of the Plan.

GENERAL CONCLUSION

The economic development of a country depends in the final analysis upon its own rts. Outsiders can render help and give sound advice. Foreign loans may tide over porary difficulties or can give a start toward sound industrial and economic developt. The United States is a great example of a country that profited from foreign capital he early period of its economic development. In the long run, however, it must be by own energy, plus the wise use of its resources, human and material, that any country make steady progress forward.

Iran is no exception to this rule. In one respect it is uniquely favored in having a t natural resource, oil, already substantially developed and bringing the Government ssured annual income, much of it in foreign exchange. In addition to this, Iran has t possibilities of development. It has many able men, and its young men have shown ptional ability to absorb quickly technical training and western learning to add to the trious background of its own history.

The great need today is the creation of confidence and a sense of responsibility to rs among Iranian leaders, the intellectuals, and the Iranian youth who show real s of capacity. There seems to be a pervading attitude of fatalism and too great a ency to believe that someone else must come to their rescue. As a result, the Seven r Plan is too largely looked upon as something to be produced abroad, financed abroad, directed from abroad.

This thinking must be changed. The Iranians who will manage the Plan must t with confidence in their ability to make it a success. Foreign aid and foreign advisers be essential, but should be viewed as auxiliary rather than as the essence of the Plan lf. And finally and possibly most important of all, some way must be found to induce well-to-do Iranian citizens, and there are many of them, to make an investment of their in the success of the Plan.

In the section of this report devoted to legal matters (Vol. V) suggestions have made as to how a start can be made to accomplish this through revision of the tax tem. Measures should be studied as to the terms and conditions under which local urces could be put behind the Plan through the raising of funds internally. This will ire education and possibly even the thinking out of new methods for stimulating local stment in domestic enterprise and in Government and municipal securities. Here, r all, may be the test as to whether the citizens think enough of their country to take ancial risk to help insure its future.

It must be recognized that today it would be difficult, if not impossible, to place estically a long-term Iranian Government internal loan, payable in rials, at any inst rate which would properly reflect Government credit. The same is true of any longn domestic industrial or other type of security. The legal rate of interest in Iran is per cent per annum. The actual rate at which the usual "bazaar" loan is made is far xcess of this rate. Iranian investors in their textile and other enterprises, lured by the ggerated returns during the war years, expect to get their capital repaid over a short e, perhaps a year or two. The idea of long-term investment in either Government bonds privately issued securities is practically nonexistent. In the initial stages there must an educational campaign and it may be necessary to exercise ingenuity to find new ns of financing which will really enlist the interest of the prospective investor. That local long-term investment is not entirely impossible in countries with an economic background such as Iran is evidenced by the measure of success which Turkey has had in floating domestic securities.

With the delivery of this report, which represents our considered judgment as to the ways and means of implementing the Seven Year Plan, the Plan Organization should be in a position to get the Plan under way. We believe that this should be done with as little delay as possible, not only because the need is urgent, but because it is important that the enthusiasm with which proposals for the Plan have been met be not allowed to wane. Unnecessary delays in getting started, indecision as to how to proceed and as to the order of preference for particular projects, might well cause public support to be withdrawn. It is hard to see how the Plan can succeed without public support.

We believe it to be vital to the success of the Plan that a foreign engineering organization be employed as adviser to the Plan Organization. This engineering organization should be deeply concerned with the success of the Plan and be ready to help the Iranian Government in any way possible and at the same time be free from political influences and local pressures. Its representatives in Iran should be capable and experienced business men, engineers and other experts, strong enough to withstand pressure from those who might seek political or personal advantage. They would select foreign technicians needed for the various phases of the Plan, they would organize the detailed studies needed before decisions could be made to proceed with any new projects, and they would advise the Plan Organization in the selection or purchase of equipment and in making contracts for work to be performed.

The services of such an organization should be continued throughout the life of the Plan or at least until such time as Iranian engineers and managers, by training and experience, can be fitted to take over the work. It must be borne in mind that the Plan, no matter how well conceived, must be modified continuously to meet unforeseeable circumstances which may arise from time to time. It must, therefore, be flexible. It must, however, be changed only after careful consideration of all factors by competent impartial advisers. The work must be carefully co-ordinated and planned so that there will be a minimum of delay between the completion of a project and its being put to use. An industrial plant without a power supply, or a mine for whose product no use or market has been developed, will not contribute to the success of the Plan.

The selection of equipment and materials, the preparation of specifications for them, negotiations for their purchase, and the organization of inspection procedures before final payments are made, would be important functions of the advisory organization. In many instances, it would be necessary for the Plan Organization to enter into contracts for the design and construction of buildings and equipment for an entire plant. Practically all of the contractors would be foreign and unfamiliar with conditions in Iran. In such case, a foreign contractor, if asked to make a firm bid, would demand a high price in order to safeguard himself against unknown contingencies. Furthermore, detailed plans and specifications would have to be completed before competitive lump-sum bids could be obtained.

It is a common practice in the United States, particularly where time is important, to contract for design and construction work to be done on a cost plus fixed fee basis. The contractor or contractors, having been furnished with preliminary specifications, prepare a rough estimate of the cost of the work for the purpose of establishing the fee.

is estimate is then discussed with the client or his advisers and an agreement is entered
o between the parties as to the amount, in money and not in percentage of cost, which
to be paid to the contractor as a fixed fee for his services. It is to the advantage of the
ntractor to keep the cost of the work within the estimate because he hopes thereby to
monstrate his dependability and to continue in his client's favor. This arrangement helps
client because it saves time, and where, as in the case of Iran, there are many unknown
ntingencies, the client pays only for those that actually develop. We believe much of
work to be done under the Plan could be performed on this basis with advantage.
re again, the advice of experienced and unbiased consultants is vitally necessary.

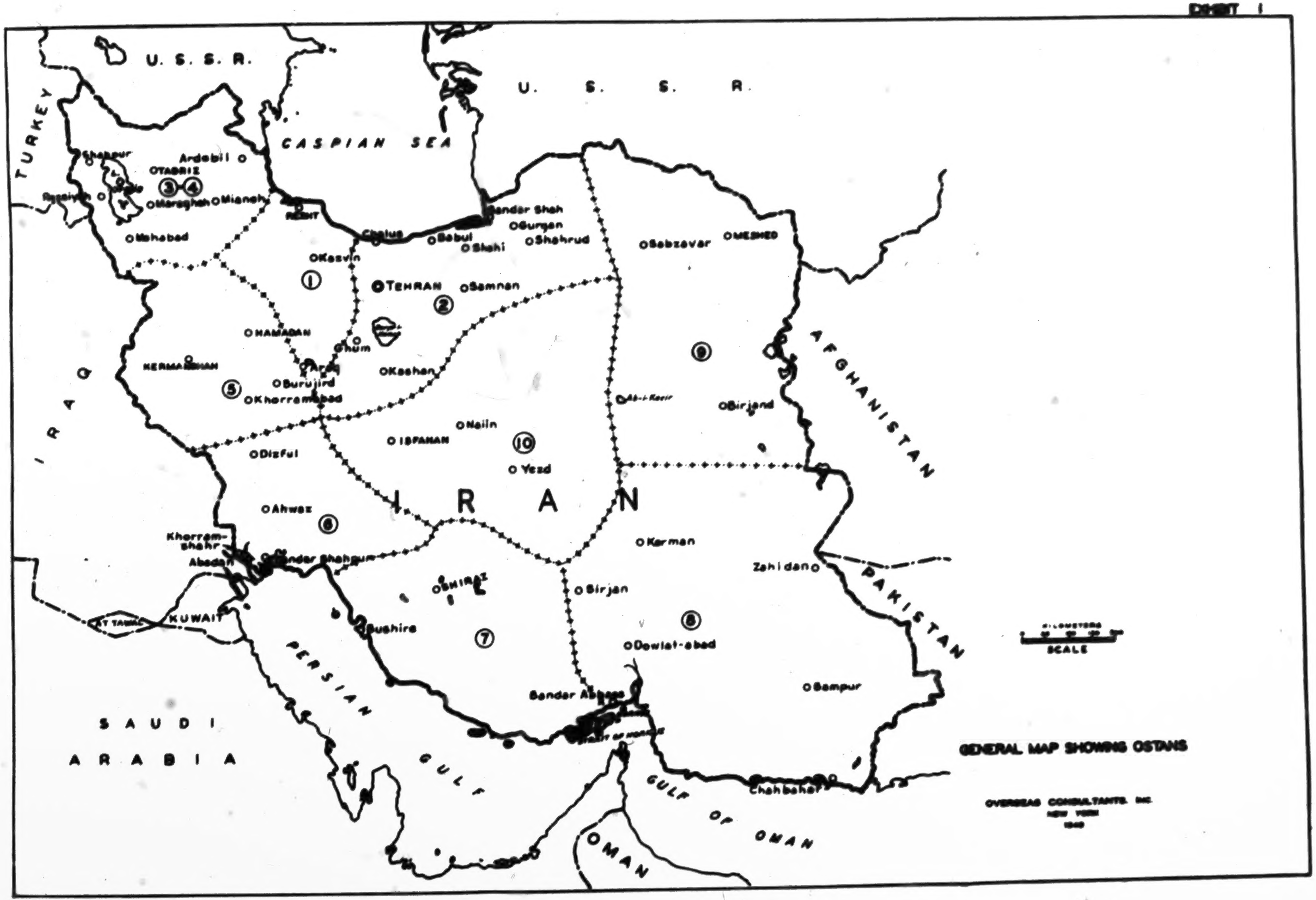
In preceding chapters of this volume, we have set forth our recommendations as
the allocations of funds under each category. In Volumes II through V these allo-
tions are discussed and shown in greater detail. The total allocations recommended
all purposes and summarized in Exhibit 3 are as follows:

Year	In Thousands of Rials		
	Domestic	Foreign Exchange	Total
1328—Second Half	595,574	592,878	1,188,452
1329	1,574,230	1,009,382	2,583,612
Remaining 5½ Years	11,424,147	5,175,600	16,599,747
Total	13,593,951	6,777,860	20,371,811

The goal which the Plan Organization has set for itself is ambitious, and it is not
sible to predict how much time will be needed to reach it. It is probable that the pro-
m now envisaged may have to be modified substantially as future circumstances
tate. We believe that, as the work of the Plan is developed, it will become evident that
rate of expenditures envisaged in the Plan should be slowed down. On the other hand,
feel that the program we have set forth for allocations of funds should be retained as
arget and as a guide for the priority of projects. Whether these allocations will be
pended within the seven years or over a substantially longer period is relatively unim-
rtant; no matter how the details may be modified, the principal objects of the Plan—
raising of the standard of living, the improvement of health and educational stand-
ls, the sound utilization of the country's natural resources and of the productive capacity
its people, and the establishment on a higher level of a self-sustaining economy—are
rthy of the best efforts of the Iranian Government and the Iranian people.

EXHIBITS

EXHIBIT 1


U. S. S. R.
U. S. S. R.
TURKEY
CASPIAN SEA
Shahpur
Ardebil
TABRIZ
③-④
Rezaiyeh
Maragheh
Mianeh
RESHT
Mahabad
Chalus
Babul
Shahi
Bandar Shah
Gurgan
Shahrud
Sabzevar
MESHED
Kazvin
①
TEHRAN
Semnan
②
HAMADAN
Qum
Kashan
KERMANSHAH
Arak
Burujird
⑤
Khorramabad
⑨
AFGHANISTAN
Birjand
Nain
ISFAHAN
⑩
Yezd
IRAQ
Dizful
Ahwaz
⑥
I R A N
Khorram-shahr
Abadan
Bandar Shahpur
KUWAIT
Kerman
Zahidan
PAKISTAN
SHIRAZ
Sirjan
⑧
Bushire
⑦
Dowlat-abad
KILOMETERS
SCALE
PERSIAN GULF
Bandar Abbas
STRAIT OF HORMUZ
Sampur
SAUDI ARABIA
GULF OF OMAN
Chahbahar
OMAN

GENERAL MAP SHOWING OSTANS

OVERSEAS CONSULTANTS, INC.
NEW YORK
1949

Exhibit 2
Page 1 of 9

BY THE AID OF
THE LORD ALMIGHTY

WE, PAHLEVI

(His Imperial Majesty's Signature)

Under Article 27 of the Supplement to the Constitution,

COMMAND THAT:

ARTICLE 1 The law authorizing the enforcement of the provisions embodied in the Report of the Plan Commission of the Majless together with the text of the Plan Commission's Report approved by the Majless on 26 Bahman 1326, attached to this Imperial Decree, shall be put into effect.

ARTICLE 2 The Council of Ministers is charged with the execution of this law.

Esfand 3, 1327

2
2 of 9

The Law Authorizing the Execution of the Provisions of the Report of the Plan Commission of the Majless.

LE ARTICLE

The Government is charged to put into force the Report No. 1, dated 4 Shahrivar of the Plan Commission consisting of 15 articles and one note; and in accordance Article 2 of the said Report, to submit within three months its working program for ven-year period to the Plan Commission for its approval.

Note 1 The High Council, the Board of Control and the Managing Director shall, following the procedure laid down in Article 9, be nominated by the Government, receive the approval of the Majless and be appointed to their posts by Royal Decree.

Note 2 Statements regarding southern oil which appear in the preamble and text of the Plan Bill are of temporary effect; the result is dependent on the outcome of the negotiations with the Oil Company.

Note 3 From the appropriations granted for the execution of the Plan, except in respect of technicians who perform technical services, nothing whatsoever shall be expended as salaries, extra allowances or compensation, the Government being charged to make use of the employees of the Ministries and from their own salary appropriations, to provide the administrative organization to carry out the Plan.

Note 4 In drawing up the Plan the Government is charged to give priority to agricultural and public health projects, and in addition to carry out the reconstruction and development program, and in particular the agricultural program, through the instrumentality of private enterprise.

This law consisting of one article and four notes, to which is attached the text of n Commission's Report, received the approval of the Majless at its session of 26 n 1327.

(Signed) Reza Hekmat
President of the Majless

The Text of the Articles of Report No. 1 of the Plan Commission of the Majless Dated 4 Shahrivar 1327

Article 1

With the object of increasing production; expanding exports; providing the prime necessities of the people within the country; developing agriculture and industry; discovering and exploiting mines and underground resources, particularly petroleum; reorganizing and perfecting means of communication; improving public health; and carrying out any kind of operations for the development of the country for the purpose of raising the standard of living and the standard of education; improving the living conditions of the people and reducing the cost of living, the Government is charged to carry out and to bring to completion within a period of seven years from the date of the approval of this law, measures which shall collectively be known as the Seven Year Development Plan.

Article 2

To carry out the Seven Year Plan for the development of the country, the funds which are specifically assigned to each of its various economic and social divisions shall be put to use as follows:

CHAPTER 1

Agriculture

Research and scientific establishments	300	million rials
Prevention of plant pests and animal diseases, and (the promotion of) animal husbandry	1,100	" "
Conservation of national resources such as forests and pasture lands	450	" "
Expansion and improvement of agricultural production	450	" "
Irrigation and construction of dams	1,850	" "
Payment to the Agricultural Bank for the following objectives:		
Increase of the capital of the Bank	150	" "
Loans to farmers	400	" "
Participation in the capital of cooperative societies	250	" "
Agricultural machinery and chemical fertilizers	300	" "
Total of the first chapter	5,250	million rials

CHAPTER 2

Roads, Railways, Harbors & Air Fields

Railways	2,500	million rials
Construction and asphalting of roads	1,850	" "
Harbors	250	" "
Air fields	400	" "
Total of the second chapter	5,000	million rials

CHAPTER 3

INDUSTRIES AND MINES

Textile industry	1,200 million rials
Sugar industry	450 " "
Iron foundries	450 " "
Chemical industries	250 " "
Pottery industries	150 " "
Rug industry and miscellaneous industries	250 " "
ines	250 " "
Total of the third chapter	3,000 million rials

CHAPTER 4

OIL

apital for the creation of the Iranian Oil Company	1,000 million rials
Total of the fourth chapter	1,000 million rials

CHAPTER 5

POST, TELEGRAPH & TELEPHONE

nprovement of postal organization	250 million rials
nprovement of telegraphic installations, wireless stations, radio broadcasting and telephones	500 " "
Total of the fifth chapter	750 million rials

CHAPTER 6

SOCIAL AND MUNICIPAL REFORMS

onstruction of low cost houses	1,500 million rials
oans to municipalities for the provision of potable water supplies, utilization of mineral waters, and installation of power plants	1,000 " "
rophylactic measures to raise the standard of public health	1,500 " "
ubsidies to technical institutions with the object of training technical staff, raising the general level of technical skill among craftsmen and peasants, and finding useful work for the unemployed	1,000 " "
rveys and statistics	300 " "
nstruction of prisons in important towns	200 " "
ther operations of public benefit	500 " "
Total of the sixth chapter	6,000 million rials
rand total for the six chapters	21,000 million rials

he funds assigned under the various chapters in this article shall be used solely ifically for the operations mentioned; if the figure of the appropriations contemor a chapter should not suffice for the requirements or, if it should be in excess of

Exhibit 2

requirements the Government may, subject to the proposal of the Plan Organization, increase or reduce the appropriation to the extent of ten per cent.

The Government is charged to cause the Plan Organization to prepare and to submit to the Plan Commission for its approval within four months of the approval of this law, the seven year working program within the limits of the appropriations assigned in accordance with this law, for each year and for each division.

Note: Within the detailed program, the Government is charged:

> Firstly, to devise measures to prohibit the use and cultivation of opium and to replace such cultivation by useful crops; and to take steps to put these measures into effect;
>
> Secondly, to plan and put into execution a useful project to construct hotels, to attract foreign tourists, and to ensure their comfort during their sojourn in Iran.

Article 3

The funds mentioned in Article 2 shall be apportioned between the seven years in the following manner:

Second half of the year	1327	1,000	million	rials
Year	1328	2,000	"	"
"	1329	2,800	"	"
"	1330	3,200	"	"
"	1331	3,500	"	"
"	1332	3,600	"	"
"	1333	3,600	"	"
First half of the year	1334	1,200	"	"
Total		21,000	million	rials

The Government is permitted in case of need, upon proposal of the Plan Organization to reduce the appropriation of any one year to the extent of ten per cent and to increase the appropriation of other years to the same extent.

Any portion of the appropriations for one year not expended shall be added to the appropriation for the following year.

Article 4

The sums mentioned in Article 2 shall be suitably apportioned to the various shahristans of the country with due consideration to the capacity and needs of each locality in such a manner that the total share of all the shahristans of each ostan during seven years shall not be less than 1,000 million rials.

Article 5

In the year 1327, 600 million rials and in the following years till the end of the seven-year period, the entire revenues of the Government derived from the payments of the Anglo-Iranian Oil Company shall be specifically assigned for the execution of the Plan.

After the expiration of the seven-year period the revenues described in this article shall be specifically assigned to service the interest and amortization payments of the loans, which, by law, may be obtained for the execution of the Plan.

CLE 6

If at the commencement of each year the funds at the disposal of the Government sufficient to meet the expenditures projected, in order to complete the sum required he execution of the Plan, the Government is permitted:

Firstly, to borrow from the Bank Melli up to the extent of 4,500 million rials at an interest rate of 2 per cent per annum. The amount of these loans in any one year shall not exceed 750 million rials.

Secondly, to enter into negotiations with The International Bank for Reconstruction and Development with a view to receiving from that bank on terms and conditions mutually agreeable, up to a maximum of 250 million dollars in installments, for the completion of operations which are directly productive of earnings; the effectiveness of any agreement drawn up in this connection being, however, subject to the approval of the Majless.

Thirdly, to obtain credits from local non-governmental institutions or from foreign commercial institutions for the purpose of completing the financial requirements of the Plan.

LE 7

All income as derived gradually from the operations mentioned in the Plan shall lly be credited to the account of the funds provided for the execution of the Plan; the completion of the Plan, and, until the indebtedness incurred by the Government or is fully amortized, they shall be used solely for that purpose.

LE 8

The supervision and overseeing of the execution of the Plan shall be accomplished h the instrumentality of a special organization to be established under the designa- f the Plan Organization.

The duties of the Plan Organization shall be:

1. To prepare plans and projects, detailed budgets, rules and executive regulations in accordance with the working program previously approved by the Plan Commission of the Majless; to supervise the execution of the operations included in the Plan from the technical and financial points of view and to oversee the coordination and cooperation of the executory agencies.
2. To centralize the funds assigned for the execution of the Plan, to disburse the expenditures provided in the plan budget and to draw up an annual balance sheet of the operations of each year.

That portion of the operations of the Plan which concerns the Government shall, e consideration of the duties of the Plan Organization, be executed through the entality of the relative Ministries, Government departments, official agencies te companies.

In matters where it is in the best interests to carry out the Plan through the instru- lity of individuals or private institutions, the Plan Organization with the approval of ncil of Ministers, shall, by way of preparing projects, finding the necessary credits tending technical and other assistance and guidance, furnish means to encourage erest the investment of private capital.

Exhibit 2
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Article 9

The Plan Organization shall be composed of a High Council, a Board of Control and a Managing Director.

The High Council shall comprise seven members who shall be appointed for the period of the Plan by Royal Decree upon nomination by the Government. In case of death or resignation or proved incapacity of any member of the High Council his successor shall, upon nomination by the Government, be appointed by Royal Decree.

The Council is to undertake the approval of plans, projects and budgets within the limits of the working program approved by the Plan Commission of the Majless; also the compilation of rules and regulations, and the approval of agreements; and in general is charged to oversee the fulfillment of all the duties for which the Plan Organization is responsible.

The Board of Control shall consist of six members which the Majless shall select from a panel of eighteen to be submitted by the Government in the manner prescribed for the selection of the Board of Government Auditors; their appointment shall be for a period of two years.

The Board of Control has the right to communicate directly with the Council of Ministers and is charged to investigate matters referred to it by the Council of Ministers and to report its findings direct.

The Managing Director shall be appointed for a period of three years by Royal Decree upon the proposal of the Government; on completion of his term he may be reappointed in the same capacity.

In case of death, resignation, or proved incapacity of the Managing Director before the expiration of his term of office, his successor shall be appointed upon the proposal of the Government by Royal Decree.

The Managing Director shall head the technical office and subsidiary departments of the Plan Organization; he shall represent the Plan Organization vis-a-vis the Government and Ministries and is, in general, responsible for the proper execution of the duties for which the Plan Organization is charged.

The Members of the High Council, the Board of Control and the Managing Director shall receive salaries for their services, and other than performing these services shall not be permitted to engage in any public, social or private occupation.

The Plan Organization shall have legal personality and financial independence; its mode of operations and the limits of its duties shall be according to a statute which shall be drawn up in agreement with the Council of Ministers and receive the approval of the Plan Commission of the Majless.

Article 10

The execution of the Development Plan in matters relating to finances and accounting and in respect of foreign exchange transactions and the conclusion of contracts and agreements shall be subject to special rules and regulations which the High Council shall draw up in consultation with the Board of Control, to assure maximum expedition, my in expenditure, and the best results; these rules and regulations shall be put ffect upon their approval by the Council of Ministers.

LE 11

In carrying out the duties for which they are responsible in the execution of the the Ministries, Government departments and Government institutions are charged t in accordance with the conditions and the directions laid down by the Plan isation.

In case of delay, infringement on the conditions, or procrastination, the Plan ization shall report the facts to the Council of Ministers; within fifteen days of the t of the report of the Plan Organisation, the Council of Ministers is charged to uch steps as may be advisable to remove the cause of criticism and complaint.

The Ministries and Government agencies are charged to place at the disposal of the Organization all papers, documents, vouchers for expenditures, and books relating execution of the projects agreed upon with them; and to make available to the Plan ization all means and facilities for supervision and detailed investigation.

LE 12

At the end of every quarter, the Plan Organization is charged to give a quarterly t of its executory operations; and, at the end of every year a working balance sheet ing its income and expenditure as well as the increase in national income and national ction brought about by its operations.

The Board of Control shall investigate and verify this balance sheet and, if it s no point for criticism, shall submit it for approval to the Government; the approval Government shall signify a proper discharge of responsibility for the period in ion.

The Plan Organization shall publish the quarterly reports and balance sheets for nformation of the public.

LE 13

The Plan Organization shall have at its disposal a number of experts and staff ent for its requirements to prepare projects, to provide for technical and financial rvision and to fulfill its other duties.

The relative expenditure shall be provided for, within the administrative budget Plan Organization which shall be prepared in agreement with the Council of Min- and receive the approval of the Plan Commission of the Majless. The entire ers of the staff and persons required for the execution of the Plan, also those em- d on special commissions shall, unless a sufficient number of experts and technicians t available among those in Government service, be engaged by inviting in the first active Government servants or those awaiting active service.

The Plan Organization may engage foreign experts for a period which shall not d one year after the expiry of the Development Plan. The engagement of these rts shall be made with the approval of the Council of Ministers and within the limits of the number and list of specialized occupations previously approved by the Plan Commission of the Majless.

ARTICLE 14

Cooperative societies formed at the instance of the Plan Organization for the purpose of fulfilling some of the operations of public benefit mentioned in the Plan shall, upon the proposal of the Plan Organization and subject to the approval of the Council of Ministers, be exempted from registration, stamp fees, and income tax for a period of five years from the date of their establishment.

ARTICLE 15

This law, within one week after the approval of the working program by the Plan Commission of the Majless, is to be put into effect in accordance with the manner prescribed under Article 2.

Authority for the enforcement of the above articles has been given by the Majless by virtue of the Single Article approved on 26 Bahman 1327.

(Signed) Reza Hekmat
President of The Majless

The original of the Royal Decree and the law are in the office of the Prime Minister.

Exhibit 3

SUMMARY OF RECOMMENDED ALLOCATION OF PLAN FUNDS

In Thousands of Rials

	1328—Second Half			1329			Remaining 5½ Years			Total		
	Domestic	Foreign Exchange	Total	Domestic	Foreign Exchange	Total	Domestic	Foreign Exchange	Total	Domestic	Foreign Exchange	Total
Public Health	55,951	19,546	75,497	176,361	29,442	205,803	1,129,717	92,114	1,221,831	1,362,029	141,102	1,503,131
Education	55,379	59,955	115,334	117,386	71,980	189,366	581,535	113,765	695,300	754,300	245,700	1,000,000
Agriculture	75,390	53,106	128,496	261,016	230,310	491,326	1,609,063	1,051,749	2,660,812	1,945,469	1,335,165	3,280,634
Water Resources	81,000	69,000	150,000	54,000	49,000	103,000	1,120,000	477,000	1,597,000	1,255,000	595,000	1,850,000
Meteorology	1,750	1,360	3,110	3,340	2,550	5,890	23,240	4,490	27,730	28,330	8,400	36,730
Surveying and Mapping	8,690	19,800	28,490	29,120	54,600	83,720	82,690	128,100	210,790	120,500	202,500	323,000
Town Improvement and Housing	21,800	5,700	27,500	207,500	42,500	250,000	1,845,700	626,800	2,472,500	2,075,000	675,000	2,750,000
Transportation	85,840	69,260	155,100	415,580	86,150	501,730	3,838,550	514,800	4,353,350	4,339,970	670,210	5,010,180
Communications	5,845	5,079	10,924	33,608	55,706	89,314	164,842	245,899	410,741	204,295	306,684	510,979
Industry and Mining	180,004	230,392	410,396	220,444	244,849	465,293	598,102	729,448	1,327,550	998,550	1,204,689	2,203,239
Electric Power	2,300	47,200	49,500	1,250	109,760	111,010	—	852,500	852,500	3,550	1,009,460	1,013,010
Petroleum	12,000	8,125	20,125	36,000	24,375	60,375	350,000	325,000	675,000	398,000	357,500	755,500
Statistical Organization	8,725	2,375	11,100	16,925	4,360	21,285	79,508	11,400	90,908	105,158	18,135	123,293
Distribution	900	1,980	2,880	1,700	3,800	5,500	1,200	2,535	3,735	3,800	8,315	12,115
	595,574	592,878	1,188,452	1,574,230	1,009,382	2,583,612	11,424,147	5,175,600	16,599,747	13,593,951	6,777,860	20,371,811
Reserved for Posts and Postal Transport												250,000
Grand Total												20,621,811

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REPORT ON

SEVEN YEAR DEVELOPMENT PLAN

FOR THE

PLAN ORGANIZATION

OF THE

IMPERIAL GOVERNMENT OF IRAN

VOLUME II

PUBLIC HEALTH
EDUCATION

OVERSEAS CONSULTANTS, INC.
NEW YORK
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VOLUME II

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PUBLIC HEALTH

PRESENT HEALTH CONDITIONS

The present health status of Iran will be discussed under two major topics: (1) the health of the people in terms of mortality and morbidity, and (2) the healthfulness of the environment or environmental sanitation.

MORTALITY AND MORBIDITY

Actual mortality and morbidity rates for Iran are not known. The total number of deaths reported from burial records in the year 1326 was 158,782, but these records are far from complete. In the first place, with a population of 17,750,000 the number of deaths reported would give a death rate well below 10 per thousand, or lower than any other country in the world. In the second place, the number of reported deaths is only half the number of reported births (337,942 for the year 1326). Had there been such a difference between births and deaths over the last generation or two, the country would have shown a rapid increase in population, which actually did not occur.

An indication that the death rate in Iran is higher than that shown by the above figures is to be found in the recognizably high infant death rate, which is believed to be over 500 per 1,000 live births. Births appear to be more completely reported than deaths, but in all probability birth reporting is far from complete. The birth rate, on the basis of the above figures, would be about 20 per thousand population. This is only about two points higher than that of the United States, whereas comparative data in countries more similar to Iran would suggest that a complete recording of all live births would show a birth rate in the neighborhood of 30 per thousand population.

Similarly we are without adequate information concerning the mortality rate for the various diseases. The majority of the population have no medical or health services of any kind and consequently no reliable morbidity data. There are 10 to 12 million persons who live in some 43,000 villages (less than 300 of which have a physician or a clinic), and the migratory tribes with an estimated population of 2 to 3 million.

The one source of morbidity data is from the Governmental treatment program carried out in 115 hospitals and 350 polyclinics. Exhibit A-1 was prepared from information furnished by the Ministry of Health and shows the distribution by cases and deaths for the diseases treated in these centers in 1326 (1947). The deaths shown total 4,393, less than 3 per cent of the total deaths reported for the year. The number of cases reported treated is about 2 million, but it is not known how many separate individuals were treated.

The data in Exhibit A-1 have qualitative and geographic significance, but are not quantitative for the country. The number of people served by these treatment facilities would appear to be not more than 10 or 15 per cent of the total population.

Our estimate of the prevalence and distribution of disease, therefore, must be based upon the reports of treatment centers and upon the expressed judgment of physicians and health officers. This applies to both communicable and non-communicable diseases which we shall consider separately.

Communicable Diseases

For the purpose of this report it will be most helpful to group the communicable diseases according to the most important means of prevention. It may be uncertain as to which method of control is most important for a particular disease, but most communicable diseases fall naturally into one of four classes according to whether the primary means of prevention is through sanitation of the environment, avoidance of contact with infected persons, immunization, or lack of adequate obstetrical and infant care.

Environmental Sanitation

Diseases subject to control through environmental sanitation may be divided into two groups, according to whether they are chiefly prevented by insect control or by proper food and water sanitation and excreta disposal, i.e. by general sanitation.

By Insect Control

Major public health problems are found among diseases spread by mosquitoes, sandflies, lice, fleas, ticks and houseflies.

Malaria is not only the most important disease in this group, but also the most important public health problem of Iran. About a half million cases are reported annually, but five million cases is the conservative estimate of Iranian physicians. Some villages have been depopulated and even abandoned because of malaria. In many areas crops could not be harvested because malaria had so greatly reduced the manpower. In a recent village spleen survey, over one hundred children were examined before a child without gross malaria infection was found.

Malaria is present in every ostan and in the rice-growing Caspian area infection is believed to be practically universal. It is present not only in these marshy areas and in irrigated regions, but also in many large cities because of mosquito-breeding pools in the yard and cisterns for drinking water. The total loss of manpower from this disease runs into many million man-days annually and the disease masks other clinical conditions confusing both diagnosis and treatment.

Other mosquito-borne diseases are relatively much less important. Yellow fever is not found, although its principal vector (Aëdes Aegypti) is present.

Dengue fever, which is also carried by this mosquito, occurs sporadically along the Persian Gulf.

A cardio-neurologist in Tehran reports having seen about eighty cases of encephalitis within the two year period 1319-1320 (1940-41). It was in epidemic form and believed to be of the equine type.

Leishmaniasis, for which the sand fly is the vector, is a disease of considerable importance. "Oriental Sore" is listed in Exhibit A-1 from every ostan except Nos. 3 and 4 with the highest reported incidence in Ostans 9 and 10. Sores around the nostrils of dogs are reservoirs of infection. In some sections facial scars from cutaneous infections are almost universal throughout all strata of the population. Systemic leishmaniasis or "three day fever" is not recorded in Exhibit A-1; medical experience in Tehran indicates that the disease is fairly common, but its presence is apparently masked by the high incidence of malaria and other febrile diseases.

The louse is important in its own right and also as a vector of disease. Pediculosis is general among the poor, while relapsing fever and typhus fever are both diseases of considerable importance. Relapsing fever is reported from every ostan, with 50,000 cases treated annually in the clinics. Typhus fever is reported from every ostan and is usually in epidemic form somewhere in the country. Tick-borne and flea-borne typhus are both present.

Human cases of plague are not known to exist at present but this flea-borne disease is present in rodents in the western part of the country. In 1326 (1947) there was an epidemic in Kurdistan which caused the death of 70 persons.

The importance of the house fly as a mechanical vector of infant diarrhea, typhoid fever, and other intestinal diseases, is well recognized. However, since diseases carried mechanically by flies involve problems in general sanitation, they will not be discussed at this point.

By General Sanitation

Infant diarrhea is a leading cause of death throughout the country. Paratyphoid fever and dysentery are reported as widespread in every province. Cholera is not currently reported in Iran.

Human cases of anthrax are reported in every ostan and the disease is widespread among animals. It is the habit of Iranians to kill sick animals and allow the blood to soak into the soil, producing reservoirs of anthrax spores from which the disease is readily transferred.

Ascaris infection is widespread, with hundreds of cases reported annually from every ostan. Intensive surveys have not been made, but health officers believe that this infection is general and in some areas practically universal.

Brucellosis is believed to be widespread in rural areas, but is infrequently reported because it is easily missed where malaria infection is general. The disease in animals is widespread.

The extent of bovine tuberculosis is not known, but some glandular tuberculosis is observed and every ostan reports tuberculosis other than pulmonary. The widespread distribution of tuberculosis in cattle suggests that infection with the bovine strain must be fairly common although laboratory facilities for differentiation are not available.

Health officers in the Caspian area report the presence of hookworm although it does not appear in the list of reported diseases.

The food poisonings and food infections (salmonellosis, botulism and staphylococcus infection) are not specifically reported; but the almost continuous series of digestive disturbances among all levels of the population suggest the widespread distribution of some or all of these organisms.

Tapeworm infections are widespread, taeniasis being reported from every province annually.

Avoidance of Contact with Infected Persons

We will consider here four groups of diseases which are largely preventable through avoidance of contact with infected persons: certain skin diseases and trachoma, the respiratory diseases, the venereal diseases, and the common exanthema of children.

Certain Skin Diseases and Trachoma

Pediculosis, scabies, fungus diseases of the scalp, and trachoma are spread by intimate contacts in the home and school. They are not controllable through general environmental sanitation, but are directly linked to the hygiene and sanitation of the home.

Trachoma is one of the most prevalent diseases in Iran, causing much blindness. Exact studies have not been made to determine its prevalence or to separate the disease from other diseases of the eye having similar symptoms; but health officials estimate that it involves 25 to 80 per cent of the population in different areas. The disease is especially prevalent in the central and southern areas.

Fungus diseases of the scalp, both ringworm (tinea capitis) and favus, are widespread. They are doubtless distributed through unsanitary public baths, lack of home sanitation, unsanitary habits of washing, and the use of common towels.

Scabies, like pediculosis, is common among the great mass of poor people.

Respiratory Diseases

Tuberculosis is widely distributed, but the rates are highest in the Caspian area where one health officer believes 90 per cent of the people in some villages are infected. The largest number of cases in the sanatoria near Tehran come from this section. Several factors contribute to the high incidence in the Caspian area: the diet is low in protein because rice is the staple cereal and very little meat or wheat is eaten; the open fire used for cooking is allowed to fill the house with irritating smoke to drive out mosquitoes; malaria is general, producing anaemia; there is little sun in this area; and malaria masks the tuberculosis in its early stages.

In general, tuberculosis is an urban disease and physicians in large cities believe the case rate to be very high and rising rapidly. We have little accurate information on the incidence of the disease, since there have been no surveys and in some of the ostans there is little laboratory service.

From field observations it would appear the common cold and influenza are at least as prevalent as in other temperate climates. We observed scores of children in poor areas where practically every child had a head cold. Exhibit A-1 shows a general distribution for tuberculosis, common cold, bronchitis, pneumonia, bronchopneumonia, and pleurisy.

Venereal Diseases

Venereal diseases represent a major health problem, but no surveys have been made to determine their extent. The assistant health officer of one large city believes that 40 to 50 per cent of the population of this city would show positive Wassermann tests. Village populations in many areas are said to have a great deal of syphilis and particularly congenital syphilis. One health officer says that in some villages 90 per cent of the people are infected.

Another health official, who visited some remote villages to study the epidemic of another disease, said that he found a large proportion of children with mucous lesions. Upon questioning the parents he found that they also had syphilitic lesions and that the distribution of the disease was very general. In fact, the parents called this disease "little trouble" and took it as a matter of course.

On the other hand, we have reports that the disease is more rare in many of the remote villages and among the migratory tribes, being present chiefly among individuals who have had city contacts, and young men who have returned from military service.

Several physicians have expressed the belief that the later stages of the disease are less severe in Iran than in western countries, due possibly to the widespread distribution of malaria, typhoid fever or other febrile diseases. There are no accurate data on this point or upon the exact nature of the causative agent.

The widespread distribution of gonorrhea seems to correspond with the distribution of this disease in other countries where syphilis is present. Chanchroid, granuloma inguinale and lymphogranuloma venereum are known to be present in the cities, but are not widespread.

Common Exanthema of Children

Exhibit A-1 shows diphtheria, scarlet fever, measles, chicken pox, meningitis, mumps, and acute rheumatic fever to be general throughout the country, with acute rheumatic fever, mumps, and measles reported most often.

Immunization

Small pox, typhoid fever, typhus fever, plague, cholera, diphtheria, scarlet fever, whooping cough, tetanus, and rabies are the diseases most readily controllable through immunization, although immunization against rabies takes place only in the case of the infected individual.

In spite of considerable attention to vaccination, smallpox is still widespread throughout Iran. Although the number of cases is not known, there are frequent local epidemics and the scars of the disease are much in evidence. Partial or complete blindness as the result of smallpox is often observed.

Whooping cough is reported each year from every province. Tetanus was reported from seven of the ten ostans last year and rabies from three.

Immunization against typhus, plague, and cholera is ordinarily used only in local areas when an epidemic develops. Smallpox, typhoid fever, diphtheria, and whooping cough are the diseases against which continuing nation-wide immunization would most naturally be directed.

Obstetrical and Infant Care

With all but a very small proportion of the babies in Iran delivered without assistance or by untrained midwives, it is inevitable that a very large number of mothers suffer from puerperal infection as well as from hemorrhage. The legal marriage age is 16, but among poor families marriages are sometimes arranged for girls 14 or younger.

Infant diarrhea represents the most important cause of death of infants and one of the most common causes of all deaths. Acute infectious conjunctivitis occurs frequently, but its extent is not known. The untrained midwives do not wash the eyes of the new born with silver nitrate or any disinfecting substance. There are no data on the number of premature births. Exhibit A-1 carries also a general heading for "Diseases of the New Born".

Other Diseases

A few diseases, not readily classified in the foregoing groups, are commented upon herewith. Among the animal-borne diseases actinomycosis is reported from six ostans, and rabies from three. Glanders is reported from five ostans. Psittacosis and tularemia are not reported. Brucellosis and bovine tuberculosis, which are widespread, have been mentioned with other diseases commonly transmitted through infected food.

Poliomyelitis has been reported by specialists in Tehran in the form of small epidemics, but the disease does not appear to have achieved serious proportions.

Leprosy was reported last year in every ostan except one, with many cases reported in the northern part of the country.

Erysipelas also appears to be generally distributed.

Acute catarrhal jaundice and mononucleosis are not reported.

Non-Communicable Diseases

We will not consider individually the many non-communicable diseases listed in Exhibit A-1, but we will comment upon certain groups of these diseases which commonly receive attention in public health programs.

No studies have been made of the extent of the dietary deficiency diseases, but physicians report deficiencies in proteins, vitamins, fats, minerals, and calories. Rickets are reported to be common in the Caspian area.

There are no data on the extent of mental diseases, though cases are frequently seen.

The extent of dental caries, malocclusion and gingivitis is unknown. The extensive loss of teeth was common among several score middle-aged hospital patients seen by us.

The use of opium is the most serious problem in the field of drug addiction. There are over 200 opium dens in Tehran alone. Recent studies by Col. Williams from the United States, and the best-informed opinion in Iran, indicate that between 1,000,000 and 1,500,000 persons are addicted to the use of opium. It is believed that about 20 per cent of these are physically ill, 3 per cent are mental cases, and the remaining 77 per cent are addicts without specific physical or mental illness. Some 70,000 persons have been treated by the League Against Opium Addiction and about one-half of them have relapsed into the habit. It is believed that those who are not physically or mentally ill can stop the use of opium without injurious physiological effect. There is an increase in the severity of symptoms for those who are ill.

The highest incidence of opium smoking is found in the Meshed and Kerman areas where 50 to 80 per cent of the population are believed to use the drug. Opium smoking is said to be next most common in Abadan, Ahras and Kermanshah, with a considerable amount in the Tehran, Resht and Isfahan areas. There is little in Azarbaijan and none in Kurdistan.

Most opium users are men, although an appreciable number of women smoke opium in those sections where it is most commonly used. Its occasional use by children and its use by adults to quiet young infants are reported.

The League Against Opium Addiction reports that 70 per cent of individuals who begin to use opium in youth have no children. The average age of death of such persons among the poorer class is 45. In order to get opium they tend to overwork and undereat.

Alcoholism is a less serious problem, although its extent is increasing.

The serious organic diseases (cancer, diseases of the heart and blood vessels, diabetes and nephritis) may be assumed to have the same relative importance as in other populations having the same age distribution as Iran. These diseases are characteristic of older age groups. In the United States their relative importance among the causes of death has risen as the infectious diseases have been conquered and the infant death rate reduced. They are serious problems, but the attack upon them usually comes later than that upon the communicable diseases, where more striking results in the saving of lives can be quickly secured.

ENVIRONMENTAL SANITATION

According to field personnel in the Ministry of Health, progress in public health is extremely difficult because the lack of sanitation produces mass infection and re-infection, and the lack of a sanitary conscience and a basic recognition of the nature of infectious disease on the part of the people prevents even such protection from disease as the individual could secure for himself.

Lack of sanitation is a primary health menace in Iran, threatening the rich as well as the poor. The rich, who possess a degree of wealth and culture comparable to that found anywhere in the world, are in the midst of insect vectors of disease, insanitary water supplies, and insanitary food. Illness and death from causes preventable by adequate sanitation are common even among the best families of Iranian society. Curative medicine is relatively helpless in the face of the present lack of sanitation and the present universal infection.

Problems of sanitation involve: insects which transmit disease, excreta disposal, water supply, ice, milk and food, housing, baths and swimming pools, school sanitation, industrial sanitation, garbage and rubbish disposal.

Insects Which Transmit Disease

Mosquitoes

Nineteen species and several varieties of Anopheles mosquitoes have been reported in Iran and the distribution of the species is nation-wide where suitable conditions for its existence are found.

Five species of Aëdes have been reported, some of which transmit dengue in the Persian Gulf area; however, yellow fever is not found in spite of the presence of Aëdes Aegypti.

Three species of Culex mosquitoes have been reported; two of these, in the Persian Gulf area, are capable of being vectors of microfilaria.

Mosquitoes breed in the Caspian ostans from Farvardin (April) to Aban (November). The Persian Gulf area and southern Iran have two mosquito-breeding seasons: Farvardin, Ordibehesht, and Khordad (April, May, and early June), and late Shahrivar, Mehr, and Aban (September, October, and early November).

Sandflies

Eight species of sandflies have been reported which are widely distributed over Iran, especially along the line from Baghdad to Meshed and farther south. They carry sandfly fever and tropical sore. Sandflies feed after dark. The sandfly season in northern Iran is from Ordibehesht (late April) to Aban (early November) and in southern Iran the first season is Farvardin, Ordibehesht, and Khordad (April, May, and June) and the second season Shahrivar, Mehr, and Aban (September, October, and November).

Lice

All three of the common species of lice are present and widely distributed.

Fleas

Three species of fleas have been reported from Iran including the oriental rat flea which transmits plague.

Ticks

Three species of ticks have been reported, all of them being vectors of relapsing fever.

Flies

Many different flies are found in Iran, including several species of the house fly type (muscidae), and the camel fly, horn fly, and stable fly.

Mites

The itch mite is widespread throughout Iran.

Bedbugs

The tropical bedbug, the temperate climate bedbug, and the stink bug are found in Iran and are thought to be capable of transmitting tropical sore and relapsing fever.

Kissing Bugs

Two species of kissing bugs frequent dwellings and feed upon man. It is possible that they transmit leishmaniasis, but they are now believed to be of little medical importance.

Excreta Disposal

The disposal of excreta in general is carried out in an unsanitary manner. There are no sanitary sewerage systems in any of the large cities and in most cities night soil is carried outside the city and sometimes used as garden fertilizer.

Occasionally the Persian type toilet is inside the house, but it is accessible only from outside the house for cleaning. Usually it is outside the house in the yard area, which is also frequently soiled. These toilets are not kept adequately dry, thereby breeding flies and producing an odor nuisance.

Excreta are commonly observed in vacant city lots and along the streets in slum areas. We also observed the deposition of both solid and liquid body wastes in jubes, the water from which is used for drinking, washing, and laundry, following little or no sedimentation. Many families in villages and tribes have no latrines.

Water Supply

No city in Iran has a complete piped water supply, although Abadan, Bushire, and Meshed have some piped water. A municipal supply is being installed in Shiraz, and steps are already under way for installing a public water supply in Tehran.

The poor people of the cities use jube water for all purposes and usually put it into a watertight pool in the yard which is often covered with scum. River water, which is commonly used for drinking in nearby cities and villages, is generally polluted. Many villages and wealthy families use water from their own kanats. It is usually of fairly good quality, but sometimes it is polluted when it leaves the ground. Kanats are underground channels which often run many miles from the foothills of the mountains, and opportunity for pollution exists because the shafts through which they were dug are left open to the surface to facilitate cleaning.

There are many shallow wells in the Caspian area and other cities and villages where the water is near the surface. These are said to be generally polluted. Actual information on the sanitation of water supply does not exist as there are no water analysis laboratories in the country.

Ice

Ice is made from dirty water and sold from open carts on the street in the summer. It can be expected to contain infectious organisms.

Milk and Food

The annual milk production, according to the Ministry of Agriculture, amounts to approximately 778,000 tons of cow and buffalo milk, and 400,000 tons of goat and sheep milk. The habit of boiling milk is well established throughout Iran. Milk is consumed in greatest quantity in the form of "mast", which must be boiled in order to kill other organisms before the milk is seeded from the old batch with an acidophilus-type bacillus; otherwise the fermentation would not be satisfactory and the product would be spoiled. Milk consumed in this form is estimated at 200,000 tons annually. "Mast" is eaten directly as fermented milk, but more often it is mixed with water to form a thin, slightly sour beverage called "doogh".

The chief danger of infection through milk is from eating butter or cheese. The country produces annually 50,000 tons of cheese and 40,000 tons of butter and ghee. These products are made from raw milk, which comes partly from cattle suffering from bovine tuberculosis and from goats with Malta Fever. In the cities ice cream made from raw milk is a source of intestinal infection.

Vegetables eaten raw are a source of danger due to the common practice of using night soil for fertilizer and polluted water for irrigating gardens. Bacillary and amoebic dysentery and other intestinal infections are commonly transmitted in this way.

Upper class people usually wash lettuce and other green foods in potassium permanganate solution, but this method of killing infectious organisms is far from certain as carried out by the average servant.

Prepared foods on sale in cities are subject to infection from flies because of inadequate protection. Food spoilage is extensive and the quality of food sold is often low.

Housing

For the common people housing is poor. In the slums and in the villages the typical house is made from mud or adobe, usually strengthened by mixing it with straw. The whole family, the average size of which is five persons, may live in one room. In the dry areas there is a dirt floor, upon which an open fire is built.

The homes of the poor contain a few utensils used in cooking and very few rugs. A change of clothing appears to be rare. During the winter the center of the room is occupied by a "koursy", which is a charcoal stove under a supporting frame. A rug or blanket is spread over the frame and the family keeps warm by lying on the floor under the rug with their feet close to the heat. Carbon-monoxide poisoning frequently occurs both from the "koursy" and the open fire. Burns are not infrequent.

In some village houses the animals walk through the living room in winter into a dark room at the rear in which they are enclosed by a wooden gate. In some of the thatched-roof houses in the Caspian area donkeys or other domestic animals occupy one end of the house.

If a family is a little more prosperous, a second room is added which is used for eating, living, and sleeping, while the first room is kept as a kitchen. In the Caspian area the second room usually has straw matting or inexpensive rugs on the floor and occasionally quilts. Some Caspian houses have a wooden floor covered with matting in both rooms and a separate room or stable for the animals. There may be a separate storeroom or "ambar". The standard of cleanliness is very low; however, occasionally one finds a very poor home which is clean, showing that cleanliness is possible.

The tribal tents, and the tents of the fisher folks along the Persian Gulf, vary from large tents to the scanty tents of the poor, with their open fires at the entrances.

Baths

The Iranian public bath is an ideal method for spreading such infections as fungus diseases of the scalp, trachoma, and other skin, respiratory, and intestinal diseases. In many villages which do not have baths, the people wash themselves with small amounts of water from containers. The village bath is usually poorly lighted and ventilated. The actual bathing is done in a large tank which is heated by a fire beneath it. The frequency of changing the water varies; in areas where water is scarce, it may be once a week or longer. A white scum that collects on the surface of the water is scraped off every day and some dirt is occasionally removed from the bottom of the tank.

There appears to be a fallacious belief that either running water or standing water in excess of about fifteen gallons purifies itself. This belief prevents a proper fear of infection at the bath. Persons with skin infections or other infections are not excluded from this type of public bath. In the large cities public baths are under partial supervision and some modern, sanitary shower-type bathing facilities are available.

School Sanitation

School sanitation is generally bad. Latrines are commonly inadequate and soiled; they are a source of fly breeding; and some are in a position to pollute the well.

Drinking water is often taken from polluted sources and kept in an open tank. Open pools are often mosquito-breeding places. Lighting is usually poor. Many boarding schools are without their own bathing facilities.

Industrial Sanitation

The big mills present rather a clean place in which to work, in contrast to the general insanitary conditions of the country. A more serious problem exists in small shops and small rug factories where sanitation, lighting, and the work posture of the individual are poor. The sanitation of the toilets is commonly unsatisfactory.

Garbage and Rubbish Disposal

Garbage collection is usually inadequate. Garbage and rubbish are often mixed and thrown into the city streets, forming piles of refuse, and some of these materials are washed along the jubes.

PRESENT HEALTH ACTIVITIES AND FUTURE NEEDS

The public health needs of the country can best be approached by adding to a study of the problems a survey of: (1) the nature and extent of professional personnel, (2) the present activities of official health agencies, and (3) the activities of voluntary health agencies.

HEALTH PERSONNEL

Graduate Physicians or "Doctor Pezeshk"

Graduate physicians register when they enter practice. This list of registrants, minus reasonable deductions for deaths and withdrawal from practice, indicates that there are probably 1,600 to 1,700 graduate physicians now active in Iran. Of these, 446 are employed by the Ministry of Health of whom 224 are in Tehran. Other ministries employ 350, of whom 245 are in Tehran. Devoting themselves entirely to private practice, there are 700 to 800 in Iran of whom about 470 are in Tehran and nearly all of the remainder are in the other large cities.

Some 300 of these physicians have been trained in foreign medical schools: in France, the United States, England, and Syria (American Medical School at Beirut). The remainder were trained in the medical school at Tehran, which graduates about 125 diplomate physicians a year. The admission requirement is the completion of eleven grades plus a twelfth year of work in the basic sciences. The present curriculum for young men and women entering this school requires six years. It includes 96 class hours in hygiene in the fifth, and again in the sixth year. A new six-year medical school opened last year at Tabriz with 143 students, 70 of whom came from outside the ostan.

Certificate Physicians "Pezeshk"

In the years 1307 (1928), 1309 (1930) and 1313 (1934) physicians were certificated to practice on the basis of an examination given to men who had completed a five-year apprenticeship with a physician. It is estimated that there are 650 such men in Iran, of whom 250 are employed by the Ministry of Health. Since 1313 (1934) the certificating of physicians in this way has not taken place. There are 170 certificate physicians in Tehran, including Ministry of Health employees and private practitioners.

Behdars (Rural Medical Officers)

Three schools have been established for training "second grade physicians for curing simple diseases which occur in villages." The graduates are not allowed to work in villages with a population of over 10,000. They are all employed in the Ministry of Health in treatment centers, but are allowed to practice medicine for fees after the regular office day of 8 AM to 2 PM. After five years of service these men may enter the fourth class of the medical school and receive their medical degree after three more years of study. Present entrance requirements demand completion of eleven grades of school. The curriculum is shown in Exhibit A-2.

It will be noted that there is no public health training in this curriculum except that which is presented in the clinical study of tropical and epidemic diseases.

There are 56 graduate behdars already in service, who have come from the school at Meshed, which is now graduating 16 to 20 men a year. New schools at Isfahan and Shiraz will graduate about 50 men each next year. Thus, beginning next year, there will be over 100 men a year coming from existing schools.

Dentists or "Doctor Dandan Pezeshk"

Dentists are trained under a four-year program of study. Prior to 1317 (1938) the entrance requirement was the completion of eleven grades. Since then a pre-dental year, including biology, chemistry and physics is also required. The instruction to both men and women is given at the Medical School in Tehran. There are an estimated 135 graduate dentists in Iran, of whom 22 are employed by the Ministry of Health, 17 of them in Tehran. The school graduates 30 to 40 dentists a year.

Certificated Dentists

Iran has about 190 dentists, who have been certificated on the basis of having had an apprenticeship satisfactory to a graduate dentist. Dentists are no longer being licensed on this basis. The Ministry of Health employs 10 such dentists.

Graduate Midwives or "Doctoress Ghabeleh"

The three-year training course for midwives requires completion of Grade 11 for admission. The school in Tehran graduates 30 to 40 per year. It is estimated that there are about 300 graduate midwives in Iran, of whom the Ministry of Health employs 135.

The curriculum of this school is shown in Exhibit A-3.

A new three-year course in the training of midwives has just opened at Tabriz. Other schools for training midwives are proposed in Isfahan and Meshed. These schools plus a new one at Shiraz should produce well over 100 graduates a year.

The new school at Shiraz trains midwives on a lower level. It accepts girls who have finished Grade 9 and gives them two years of training in four 6-month periods of study. This school will graduate its first class in 1329 (1950) and expects to produce 46 graduates the first year and some 15 annually thereafter. The curriculum of this school is shown in Exhibit A-4.

Untrained Midwives

There are thousands of untrained midwives who deliver babies, but none are employed by the Ministry of Health.

Pharmacists or "Doctor Daroo-Saz"

A four-year training school for pharmacists is operated at the University in Tehran. It graduates 40 to 50 men and women a year. Admission requires eleven grades and a pre-professional year. It is estimated that there are 230 graduate pharmacists in Iran of whom the Ministry of Health employs 43. There are also some 100 foreign-trained pharmacists.

These pharmacists are improperly called ''Doctors'', and over-the-counter prescriptions by pharmacists have been a health problem. A bill was introduced into the Majless in Esfand, 1327 (March, 1949) to forbid pharmacists to practice medicine.

There are some older pharmacists who are without formal training but such pharmacists are no longer licensed.

Nurses, Pezeshk-yars or Physicians' Aids

Special two-year pezeshk-yar training schools are operated by the University and by the Army. There are several hundred such male medical aids in the Army.

Up to 1319 (1940) only six grades of elementary school were required for admission to the school at the University. Now graduation from Grade 9 is required. The number of civilians graduating each year is now 24 and will be 50 in the future. The number of such men in Iran is estimated at 500, of whom about 100 civilian pezeshk-yars have graduated from the University of Tehran. For curriculum see Exhibit A-5.

The Ministry of Health employs 477 men and 85 women in such posts. But many of these older employees are without formal training.

Graduate Bedside Nurses

A school for training graduate bedside nurses is about to open under the auspices of the Imperial Social Service Organization and the University. British nurses are in charge of this school. Students must have eleven grades for admission and will follow in general the British training program for three years of study. It is expected that some 50 nurses will graduate each year beginning in 1331 (1952). Some of these nurses will probably take a further year of graduate training in public health to prepare for public health nursing.

Village Nurses

In Shiraz a one-year study program for village nurses has been started for girls who have had six grades of school. The number of graduates annually is expected to be about twenty.

The curriculum is shown in Exhibit A-6.

Practical Nurses

Practical nurses have been trained in many hospitals through experience alone. The Ministry of Health now employs 713 male nurses and 525 female nurses of this type in its hospitals.

Public Health Nurses

Plans are under way for a school to train public health nurses on a three-year basis. The school is expected to be developed co-operatively by the Imperial Social Service Organization, the University, and the Rockefeller Foundation. It will take girls after eleven grades of school and give a basic training for bedside nursing plus public health nursing to equip them for work in health departments and health centers. It will graduate about 25 girls each year.

Health Officers

The present health officers are physicians without graduate training in public health. There was recently one physician in the Ministry of Health who had graduate training in public health, but he has accepted a position with the World Health Organization. One physician is now studying public health abroad. A proposed demonstration health administration area will furnish a center for field training in public health.

Public Health Engineers

There are none, either trained or employed.

Health Educators

There are none, either trained or employed.

Vaccinators

The Ministry of Health employs 323 vaccinators who have had no formal training, having been taught to vaccinate by health officers.

Laboratory Technicians

Such persons are not given formal training at present, but some have been trained by health officers on an apprentice basis.

Nutritionists

No nutritionists are trained or employed in Iran at present.

PERSONNEL NEEDS

Physicians

Although the Seven Year Plan is restricted to activities in the field of public health we may observe in passing the health needs in the field of curative medicine. The number of physicians is roughly one to 10,000 persons. This ratio is, of course, low and is due basically to the large mass of poor people, especially in villages, who cannot afford to purchase scientific medical care. On the other hand, the number of physicians available to serve the rich and middle classes in the cities is probably one physician to 500 or 1,000 persons, a high ratio.

The number of physicians needs to be increased to provide adequate treatment for the population, but it can be increased only at the rate at which either the general public or the Government is ready to increase its expenditures for medical service. With 125 physicians graduating each year at the University, the number of physicians is increasing at the rate of about 8 per cent, a relatively high rate of increase. The quality of medical training is fairly good and is improving.

Bedside Nurses

There is also need to increase the number of properly-trained bedside nurses in order to replace the present untrained attendants in hospitals and to provide adequate nursing to those families which can afford it. As the economic resources of the Government and individuals improve an expansion in the number of hospitals and of both the medical and nursing professions will be needed.

Public Health Specialists

The absence of public health specialists, including physicians with graduate training in public health, points to the need for the training of public health personnel abroad. A few top-flight leaders at the national level are needed in the respective fields of public health.

In addition there is need for inservice training programs to improve the quality of the public health work carried on by the personnel already employed. This can be done in part by technical supervision and guidance, but special emphasis must be placed upon intensive short courses or institutes.

Trained Midwives

At present there is only a handful of properly-trained midwives and they are in urban areas. The country needs trained midwives in all areas.

Behdars (Rural Medical Officers)

As noted elsewhere behdars are at present trained only in clinical medicine. Those who are to undertake rural health programs, instead of being employed in hospitals and polyclinics, must be given basic public health training in such areas of knowledge as rural health administration, health records and statistics, basic sanitation, health education, maternal and child care, and communicable diseases.

Vaccination

A brief apprenticeship training followed by the employment of men for only a single activity, like vaccination, is unsound. Vaccination should be transferred as soon as possible to medical and nursing personnel, and, if the present "vaccinator" type of man is used, his training and services should be broadened.

Sanitation

Trained personnel in the field of general or basic sanitation is needed.

Public Health Nurses and Home Visitors

Public health nurses and home visitors are needed. Cities and wealthy communities can begin to use well-trained public health nurses in the near future, but advancement in home management and child care for village people will have to be promoted in the next few years through the services of less highly-trained home visitors or through the services of trained midwives.

Health Educators

A limited number of health educators will be needed to develop a public health education program adapted to the needs of the people and to promote improved health education in schools.

Public Health Training of Medical Students

The public health training of all medical students should be made as strong as possible because it will largely determine the future reaction of the medical profession to the public health program and greatly influence the success of that program. The teaching of principles of public health organization, the responsibility of government and of the medical profession for disease prevention, basic activities in sanitation, maternal and child health, communicable disease control, and other special health programs should be supplemented by field visits. The socio-medical study of a particular family and other health studies would make good thesis subjects.

OFFICIAL AGENCIES

The Ministry of Health

The chief Governmental agency in this field is the Ministry of Health. Its present program, however, is primarily a program of curative medicine. Not more than 5 to 10 per cent of its budget is spent upon public health activities. It is more like a welfare agency or a "Ministry of Hospitals and Public Assistance."

This situation has come about naturally, once a few hospitals and polyclinics were established, because, although only a fraction of the needed therapy can be provided, the Ministry is under constant pressure from the public and the Majless to increase facilities for medical care.

We shall discuss the organization, personnel, salary scale, budget, and technical activities of the Ministry of Health, keeping in mind the fact that nearly all the budget is now spent upon hospital and clinic operation. Its limited public health expenditures are to be found mainly in the vaccination program, the operation of quarantine, and the emergency control of local epidemics. It is true that tuberculosis, trachoma, and venereal diseases are treated in the clinics, but the present treatment is palliative instead of being part of a public health program against these diseases.

It should be kept in mind also that the health program is highly centralized at the national level, that nearly all health personnel is employed by the Ministry, that there are very few health activities supported at the local level, and that the rural areas are almost completely without health services.

This lack of a well-organized program of public health or preventive medicine and the lack of any health program whatever in the rural areas suggests the magnitude of national health needs.

Regular annual public health reports are not published either nationally or locally.

Administration

Organization

The organization of the Ministry of Health under the Law of 1324 (1945) is shown in Exhibit A-7.

In recent years the post of Minister of Health has changed hands frequently with changes in the Government, but the position of Under Secretary has been held for much longer intervals. During the past five years a post of Technical Adviser has been held by an American.

The Superior Council of Health under the direction of the Minister of Health is a policy-forming body.

The Pasteur Institute prepares vaccines and carries on research under a policy set by the Ministry of Health.

The Central Administration consists of three general sections: Inspection, Administration, and Technical Services; each is under a graduate physician, and operates with such authority as is given to it by the Minister of Health. The Minister of Health can, with the approval of the Council of Ministers, change the administrative departments, or form new departments.

The Division of Inspection has 45 employees, 17 of whom are physicians. It is concerned primarily with personnel problems and not with the maintenance of the technical quality of health and medical services.

The Administrative Division is concerned with accounts, supplies, property maintenance and the appointment of personnel.

The professional activities in the Ministry of Health are carried out under the Technical Division with its ten departments. Not all of these departments have permanent chiefs and in no case is the department head responsible for the technical quality of work in his field throughout the country.

The Director of the Technical Division, with his administrative assistants, has immediate control over contagious disease activities and general control over other activities. He gives specific assignments to specialists in individual diseases like tuberculosis, venereal disease, and trachoma; health education, maternal and child health, food and drug control, and vital statistics. He refers technical questions to them; however, they do not have responsibilities for national programs in these respective fields. The nature of the present activities of these various fields will be discussed below.

The ostan health officers are employed by the Ministry of Health. Their duties are not well defined and most of their time is spent in administrative correspondence and in guiding the treatment programs in the ostan capitals.

Personnel and Salary Scale

Exhibits A-8, A-9 and A-10, prepared from information furnished by the Ministry of Health, indicate the types of personnel and their distribution. Exhibit A-8 shows the technical personnel in the year 1327 (1948) and also gives the populations of ostans as well as the numbers of hospitals and polyclinics. Exhibit A-9 gives somewhat comparable data for the year 1326 (1947), but also includes non-technical workers and the total number of employees. These two exhibits are in general agreement, but they vary somewhat, not only because they represent different years, but also because they represent some differences in classification of workers. Exhibit A-8 was prepared from central Ministry of Health records, and Exhibit A-9 was taken from the reports of ostan health officers.

The absence of health educators, public health engineers, sanitarians or sanitary inspectors, public health nurses or home visitors, nutritionists, laboratory technicians and statisticians from these exhibits will be noted. However, they indicate basic training rather than professional assignment and do not mean that none of the activities ordinarily carried on by such specialists are to be found in Iran.

Exhibit A-10 was prepared by the Ministry of Health and shows the extent and distribution of hospital facilities and physicians in private practice in Tehran and in the different ostans.

The salary scale is a vital factor in determining the quality of any technical or professional service. The present salary scale in the Ministry of Health is very low, in fact so low that the employees throughout the country almost always have some other employment or source of income in addition to their public health job. This applies not only to the physicians, who are usually engaged in a much more remunerative private practice, but also to other personnel. In general employees show far too little enthusiasm for their work in the Ministry, and frequently special assignments and missions are without volunteers.

One difficulty which exists is that doctors and other personnel who go to ostans say they are forgotten. Drugs do not arrive and even their salary does not arrive. They advise the Ministry that the salary has not come, and there is often a long wait before a letter arrives saying that the salary is in the mail.

The determination of an adequate salary scale is not easy. In general Government service is expected to pay less than successful private professional practice. The Ministry of Health salaries in Iran, however, are lower than those of comparable services in other divisions of the Government, and lower than those in voluntary health agencies. A detailed discussion of salary scales for all types of workers cannot be entered into, but the need for higher Ministry of Health salaries is evident, especially if men and women are to be assigned to full-time public health work.

The Budget and Its Operation

The budget issued by the Ministry of Health for 1326 is shown in the following table:

	In Thousands of Rials
Miscellaneous and travel	79,547
Administrative expenses	84,848
Technical	1,250
Drugs	9,500
Food (hospital)	20,000
General and provincial expense	11,130
Total	206,275

From such a budget neither the Parliament nor the people can see how the funds are expended or learn the distribution of funds between curative and preventive medicine. Allotments are not made to specific public health functions. In this highly centralized system most of the cost of local health administration is met from the national treasury. The ostan health officers do not submit proposed budgets. Each is advised as to the approximate amount of money available for routine expenditures. For many expenditures the health officers must write to Tehran for an allotment, which has to be approved by the Ministry of Health and also by the Ministry of Finance. Thus funds are often delayed or unavailable even in urgent situations.

There are no local funds for public health in rural areas. The large cities spend little on health. Tabriz raised about Rls. 30,000,000 in local taxes and spent Rls. 600,000 on health last year; Shiraz raised Rls. 30,000,000 and spent Rls. 300,000 on health.

Certain changes in budgetary practices are obviously needed in the interest of fixing responsibility, checking operating efficiency and distributing funds to the best advantage. It is desirable to:

1. Separate the budget for hospitals and treatment clinics from that for public health.
2. Allocate funds for specific purposes, activities, and divisions, including annual reports at both the national and ostan levels.
3. Require each provincial health officer to submit a proposed budget for his ostan.
4. Make available to the Health Department of each ostan, at the beginning of the year or as early as possible, the funds assigned to it for its regular functions and for epidemic control, their expenditure to be the responsibility of the ostan health officer under the direction of the Ministry of Health and in accordance with existing laws and regulations.
5. Decentralize public health administration so that local municipalities or areas shall pay a greater share of the cost from local taxes and carry a greater degree of control over local public health work.

Technical Services

The technical services now rendered by the Ministry of Health will be discussed under headings corresponding to the various Departments of the Ministry as shown in the Organization Chart in Exhibit A-7, as follows:

Statistics

Hospitals, Dispensaries and Laboratories

Prevention of Contagious Disease
Quarantine
Supervision of Health Affairs of Municipalities
Maternal and Child Health
Propaganda, Publications and Health Education
Arrangement of Medical Affairs
Food and Drug Control
Health Institute, Research and Planning.

Statistics

Data concerning the incidence of certain communicable diseases are collected weekly by the Department of Statistics. Reports are sent by telegram from the 350 health stations every Saturday, stating the number of cases and deaths. These data are organized into a weekly bulletin, copies of which are forwarded to the World Health Organization. The monthly reports are sent to certain foreign countries and to ostan health departments in Iran.

These reports, of course, cover only the cities and larger towns which have treatment centers, and they include only the cases which come to the attention of hospitals and polyclinics. Physicians in private practice do not, with rare exceptions, report communicable diseases although there is a law indicating that this should be done. There are no data from isolated villages or from the nomadic tribes except as persons from these groups may occasionally be taken to treatment centers in the larger places.

In addition to the above-mentioned data, the Ministry of Health also receives information from treatment centers concerning 111 diseases reported in Exhibit A-1. These data also indicate only cases which have come to the attention of the Ministry of Health officials.

The death records are taken from the Department of Registration, a separate department of the Government which registers deaths, births, marriages and divorces. In the cities a municipal physician is attached to the operation of the cemeteries, and in many cases it is he who makes out the death certificate, guessing at the cause of death on the basis of such information as he gets from the family. Where a private physician is employed, he makes out the death certificate. The card recording the death is sent to the clerk in the Department of Registration and a record is also sent to the Tax Department. In villages without medical services, the mayor gets two signatures on the death record and retains these death-record cards until the representative of the Department of Registration calls to collect them. Such representatives make their way from village to village.

According to law, births must be recorded within ten days and the family must apply for a birth certificate from a station of the Department of Registration in the cities, or from the village mayor. It is the responsibility of the parent to secure this birth registration and there is punishment, including either fine or imprisonment or both, for failure to record the birth of the child. This law has been in effect for some 20 years and inasmuch as the birth certificate is needed in connection with military service, marriage, rationing, voting and other civic activities, the Ministry of Health believes that 95 per cent of the births are probably recorded, although this is far from certain. Obviously, birth recording is much more complete than death records, because the year 1326 (1947) showed 337,942 births and only 158,782 deaths. Births are usually not recorded in the case of infants who live less than ten days.

Data concerning births, deaths, marriages and divorces are supplied to the Minister of Health from the Department of Registration upon the former's request. Such data are secured annually or more frequently should special need arise.

The present specifications of diseases and deaths is in general accord with an earlier International List of Causes of Death.

The need for more extensive and accurate vital statistics is obvious. The present statistics in Iran are of limited value, not only because of the lack of coverage of three-fourths of the population, but also because the diagnoses themselves are unreliable and without the support of laboratory findings.

Iran cannot suddenly acquire a complete and standard program of biostatistics, but it can make progress toward that end. In doing so it needs to:

1. Adopt the current sharply-modified revision of the International List of Causes of Death.
2. Train one or more specialists in biostatistics.
3. Train present health officers and statistical clerks in the keeping of public health records.
4. Secure public health surveys to determine the present incidence of certain communicable diseases.
5. Establish approved birth and death registration areas in cities or sections of cities.

For further information on statistics see the section on statistical organization in Volume V.

Hospitals, Dispensaries, and Laboratories

The operation of hospitals and polyclinics is a major activity and the chief item of expense in the work of the Ministry of Health, but no detailed study of the program of curative medicine has been included in this survey. However, the treatment program does present certain obvious public health problems.

Having started a treatment program the Ministry of Health finds itself under tremendous pressure to expand it. Because there is no administrative and budgetary separation of the treatment program from the public health program, funds which should go into prophylaxis tend to be swallowed up by the program of medical care.

Clinics

Clinics for treatment of venereal diseases, diagnostic clinics for tuberculosis, pre-natal clinics and well-baby clinics are an essential part of a good public health program, but they should be linked with the other public health activities. The present palliative treatment of venereal disease, tuberculosis, sick mothers and sick babies as part of a general treatment program is not effective from the public health viewpoint.

The present treatment program in the various ostans is not under central technical supervision and many physicians feel that it is unsatisfactory from the therapeutic standpoint. The quality of service varies in different clinics, but in general the polyclinics give palliative treatment for the alleviation of symptoms. For example, the following list of 14 diseases is quoted from a typical polyclinic record:

Abdominal pain
Indigestion
Ringworm
Rheumatism
Pyorrhea
Abdominal pain
Weakness
Sore nose
Not known
Malaria
Scabies
Diarrhea
Indigestion
Abdominal worms

The patient usually stops treatment when symptoms are alleviated instead of continuing treatment until a cure is effected; this is usually true even in the case of a communicable disease. A recent conference of ostan health officers stated that the present treatment is given ''in a defective manner''.

Dental clinics are to be found in several of the large cities, but they are essentially devoted to extraction, with some treatment for gingivitis. There is no oral prophylaxis or orthodontia, and practically no reparative dentistry.

Laboratories

Laboratories are under the jurisdiction of the Department of Hospitals of the Ministry of Health, although in other countries public health laboratories usually form a separate division.

There is no central public health laboratory serving the entire country and there are no laboratories for water analysis, although on rare occasions the Pasteur Institute has run bacteriological tests upon water. The public health laboratories of the ostans have no facilities for preparing and using culture media, and some of the ostans have no operating laboratory facilities whatever. Others do only Wassermann tests and smears for tuberculosis, the standard methods for which are not subject to check by the Laboratory Department.

The Ministry of Health reports 19 private laboratories in Tehran and a total of 24 in other cities. These are primarily concerned with clinical tests for private physicians.

Neither in Tehran nor in the ostans does the public health laboratory perform any appreciable fraction of the tests necessary to diagnose disease, to say nothing of providing laboratory service for public health surveys and disease prevention programs. For example, the central health laboratory in Tehran in the year 1325 (1946) ran diagnostic tests in the following number:

1,200	Sputum examinations for tuberculosis
252	Weil-Felix reactions for typhus
623	Widal tests for typhoid

Food adulteration tests are almost non-existent. Neither are there laboratories in the ostans for the diagnosis of animal diseases.

Public health administration is forced to work in the dark when there are no proper laboratory facilities. Adequate laboratories with trained personnel must be provided for diagnosis, for the sanitary control of water supplies, for the control of food sanitation and for the prevention of food and drug adulteration.

Pasteur Institute

The Pasteur Institute, although not a part of the Technical Division of the Ministry of Health, is under the general administrative control of the Ministry, and will be considered at this point in connection with other laboratories. It is a well-run institution with modern scientific control. It makes typhoid, smallpox, and phenolized rabies vaccines, and typhus vaccine as necessary. This laboratory also prepares for distribution distilled water, normal saline, normal glucose solutions, and a buffered solution of penicillin. Research is under way at this institution on relapsing fever and on plague.

It is not possible to manufacture sulfa compounds in Iran and the Director believes it would be helpful to import these preparations in bulk. A basic glass-manufacturing industry does not exist in Iran, although some glass is melted down and remade into bottles and containers. This remade glass cannot be used for certain chemicals because of its impurities.

Importation of biologicals in summer through the Gulf ports is a problem because the extreme heat usually destroys them. Silver nitrate ampules are not made in Iran because the present method of putting them up in paraffin makes them unusable in the very hot climate.

The Institute makes eight or nine million doses of smallpox vaccine annually, but it believes that only half a million are successfully used, and the rest spoil. The work of the present vaccinators is believed to be unsatisfactory. They are said to be paid so little that they often stay at home or get another job and send in false reports.

Bacillus Calmette-Guerin (BCG) vaccine is made at this institution and an attempt has been made through the Ministry of Health to secure volunteers for vaccination. However, not more than seven or eight hundred children have been vaccinated during the last two or three years, due to a shortage of volunteers.

Ten million doses of cholera vaccine were produced two years ago. Three hundred thousand doses of typhoid vaccine have been made although it is believed that not more than two thousand doses have been used in any particular year. Production facilities are ample.

The Institute has a budget of Rls. 5,000,000 and an additional building fund.

In this field we see the need to:

1. Transfer treatment services gradually (with budgetary consideration) to municipalities and voluntary agencies so that medical care may be extended and local areas bear their share of the cost.
2. Immediately form a separate Division of Hospital and Treatment Services, with its own budget and personnel, and with medical supervision of clinic methods.
3. Establish a separate Division of Public Health Laboratories and develop an adequate public health laboratory system.

4. Organize clinic services, separate from the general treatment program for the non-self-limited communicable diseases such as tuberculosis, trachoma, and venereal disease, as part of a public health program to stamp out these diseases.

Prevention of Contagious Disease

The Department for the Prevention of Contagious Diseases, in the Ministry of Health is divided into eight subdivisions as follows: malaria, typhus, intestinal diseases, vaccination, venereal diseases, trachoma, tuberculosis, and leprosy. Each ostan health officer carries on his own program for communicable disease control, but in the case of a severe epidemic, an epidemiologist with an epidemic team is sent to the area from the Ministry of Health.

A specialist is usually assigned to each of the eight sub-divisions; however, he does not have technical supervision over the program nationally.

Malaria

This number one health problem has already received considerable attention, and a few communities have made some progress in drainage and the prevention of mosquito breeding, but only in the Abadan area has malaria been brought under control. More recently beginnings have been made toward malaria control through the use of DDT.

The Near East Foundation, whose program is discussed elsewhere, has appreciably reduced malaria in a group of Veramin villages through an organized and scientific program of spraying with DDT the interior of all buildings occupied by persons or animals. Working with the Imperial Institute for Social Service, this agency has also developed demonstration spraying programs in Baluchistan and other areas. The Near East Foundation has the services of a capable American sanitarian, widely experienced in malaria control, and a well-trained Persian staff.

Through the co-operation of the Ministry of Health, the Iran Foundation, and the United States Public Health Service, Dr. Justin Andrews came to Iran late in 1948 and made a malaria survey with suggestions for an anti-malaria program.

The Ministry of Health has purchased a considerable quantity of DDT and in Esfand, 1328, brought Mr. Lawrence Hall, a capable sanitary engineer from the United States Public Health Service, to Iran to teach a group of male nurses or medical aids the technique of spraying houses with DDT. Assistance from outside was needed because the Ministry of Health has no Public Health Engineer. However, it was not necessary to bring in someone from abroad because the necessary skills were at hand in the Veramin Village Project of the Near East Foundation, with which the Ministries of Health, Education, and Agriculture were already in close co-operation. There would have been advantages in using the Veramin Village Project for this training program since the villages represent an area where successful spraying has been demonstrated, and where the people have had a satisfactory experience with this method of malaria prevention. The well-trained Persian staff could have given direct instruction without the necessity of using an interpreter.

In Esfand, 1328, the World Health Organization (WHO) sent two experts in malaria control to Iran for a visit of several weeks before continuing on to India for a two-year program. WHO is also providing fellowships for limited periods of study abroad, and may be in a position to send a team to assist in the expanding program of malaria control.

Malaria is certainly the worst enemy of agricultural efficiency and perhaps also of industrial efficiency, so that the urgent need for malaria control is obvious.

Typhus

The frequent epidemics of louse-borne typhus are controlled by ostan health officers or by epidemic teams from the Ministry of Health through isolation, delousing, and immunization. The effectiveness of chloromycetin offers a new means of rapid cure. There is obvious need for a continual epidemiological service until improvement in general sanitation reduces or eliminates this disease.

Intestinal Diseases

Control of intestinal diseases is possible through general sanitation. The Ministry of Health does not have a Department of Sanitation and Sanitary Engineering, nor does it have sanitary engineers or sanitarians. It does have a Department of Supervision of Health Affairs of Municipalities, but sanitation is usually left in the hands of local governments. Present activities in the field of sanitation are discussed later in connection with local health administration.

Vaccination

This sub-division provides facilities for vaccination and immunization. During the winter months 323 vaccinators are employed to vaccinate against smallpox. In most cases the man spends the greater part of the year as a hospital orderly, and many ostan health officers are dissatisfied with the program. One estimates not more than 5 per cent of his people have been vaccinated against smallpox, another estimates 95 per cent. Most tribes have had no vaccinators.

It should be possible to reduce smallpox to negligible proportions by:

1. Extension of vaccination requirements.
2. Extending the vaccination program in cities through midwives, public health nurses, and disease prevention aides.
3. Sending vaccinators to remote villages.
4. Training disease prevention aides (sanitarian-vaccinators) in the tribes.
5. Better provision for the transportation and storage of vaccines.
6. More active vaccination programs in the cool months.
7. Facilitating the transport of vaccines by mail.
8. The use of dry vaccine which will soon be manufactured at the Agricultural Institute.
9. Checking the efficiency of vaccination programs by child surveys of scars.
10. The vaccination of infants in cities before the birth certificate is issued.
11. Promoting isolation of cases in epidemic control.
12. Revaccination at school entrance.

The present immunization activities in other diseases are mainly limited to the immunization of contacts in time of epidemic and to the immunization of school children against diphtheria in a few of the cities.

There is a need to extend vaccination against typhoid fever immediately and widely, because the disease is prevalent, sanitation cannot be achieved overnight, and there must inevitably be thousands of typhoid carriers.

Immunization against diphtheria should be extended to school children immediately and to all children as rapidly as possible.

Immunization against whooping cough and tetanus should be developed as rapidly as public health and prophylactic centers can be provided.

Venereal Diseases

The subdivision for the prevention of venereal diseases has no institutes for the intensive training of health officers in the latest methods of venereal disease control. There are no blood tests for expectant mothers and there is no premarital blood testing. There have been no intensive campaigns involving blood testing for large groups of persons and no educational programs. There are treatment programs for the venereal diseases in urban areas and in some large village sub-stations, but they are part of the curative polyclinic service. The traditional method of treatment for syphilis is followed in all clinics. Penicillin is not used in early cases or for expectant mothers. There are no case-finding programs and there is little or no follow-up which will keep the cases under treatment until they are cured.

Penicillin is widely used in the treatment of gonorrhea in the larger cities, but the traditional methods of treatment are still followed in many of the smaller clinics.

Chanchroid, lymphogranuloma venereum, and granuloma inguinale are treated in city clinics, but are minor problems.

Organized prostitution is not sanctioned or recognized by law, but it exists in cities and large towns to a considerable degree, and often in restricted districts. There are no prophylactic stations in these areas, but a voluntary agency has established a treatment clinic near the restricted area in Tehran. Plans are made by this agency for venereal disease treatment clinics in each of the other ostans in the near future.

Drug store prescriptions are commonly given by pharmacists. Isolation facilities for the treatment of recalcitrant cases are found only in the largest cities and are limited in extent.

Expert leadership is needed and adequate preventive activities along such lines as:

1. Blood tests for expectant mothers and treatment where needed to prevent congenital syphilis.
2. Pre-marital education and (later) examination.
3. The cure of soldiers before their discharge from the Army.
4. The reduction of prostitution.
5. The institution of rapid treatment methods.
6. Mass serological examinations of special groups followed by the treatment of infected individuals.
7. The restriction of drugstore prescriptions and self-medication.
8. Public education.
9. Intensive venereal disease campaigns in demonstration areas.

There is a law, approved in Khordad, 1320 (June, 1941), giving to health departments the legal authority needed in the control of venereal diseases. The Government is, therefore, in a position to undertake a vigorous campaign against these diseases when it has the necessary personnel and funds.

Trachoma

One program in the Abadan area, in co-operation with the Anglo-Iranian Oil Company, has led to the reduction of trachoma through general sanitation and the treatment of cases, with special activities in the schools. The Ministry of Health has an ophthalmologist who has initiated some trachoma clinics in the Kazvin area. The Imperial Social Service Organization is planning a program of sanitation and trachoma control in Dizful where the rate is said to be the highest in the country. A few centers have established trachoma clinics where electro-coagulation treatments are given. The experience in the United States with sulfanilamides in reducing trachoma on one of the large Indian Reservations, from 26.6 per cent in 1937 to 3.6 per cent in 1941, suggests the need for an experimental anti-trachoma program in selected localities which can be expanded as rapidly as practicable.

Tuberculosis

It seems almost certain that the incidence of tuberculosis is increasing. The three small sanitaria near Tehran do not begin to answer the needs of the country. Certainly there is a tremendous number of unrecognized cases spreading infection through close contact with their families and fellow workers.

No skin testing is being carried out and there has been no X-ray survey. A few children have been given BCG vaccine at the Pasteur Institute but not enough to constitute an experiment. There are a few voluntary agencies in this field, but there is no possibility of the construction of enough hospital beds in the near future with either Governmental or private funds. The lack of isolation of advanced cases, of facilities for early treatment, and of health education is serious. With the increase of urban populations and the expansion of industry, tuberculosis is likely to increase further.

Improvements in housing, nutrition and hygienic living may make the greatest immediate contribution toward curbing this disease. In other countries, including the United States, reduction in the tuberculosis death rate has taken place with the improvement of economic status, prior to the inauguration of a vigorous anti-tuberculosis campaign.

Specific steps could be taken in the direction of:

1. Case findings by means of skin testing and X-ray, especially in industrial groups.
2. Education concerning the care of tuberculosis in the home.
3. Education of the public concerning the nature and spread of the disease.
4. Protection of workers in silica dust.
5. Pasteurization of milk used in cheese, butter and ice cream (until such time as general milk pasteurization becomes practical.)
6. Separation of babies from tuberculous mothers at birth.
7. Eradication of bovine tuberculosis.
8. Increased treatment through collapse therapy.

9. Expansion of sanitarium facilities as soon as possible.

Leprosy

Limited leprosaria facilities are being used; case finding should be extended.

Quarantine

Iran has a series of stations to provide some supervision over land, sea and air traffic. There are quarantine stations at Zahidan, Khorram-shahr, Abadan, Bandar Shahpur, Bushire, Bandar Abbass, Pahlevi, Naushar and at the airports of Tehran, Abadan and Zahidan.

Important changes are now taking place in the character of international travel. There is an increasing amount of air traveling. Once busy ports along the Caspian are now inactive. Changes in the port facilities along the Persian Gulf will alter the amount of travel coming into the respective port cities.

A survey will be needed in the light of the Seven Year Plan to determine the need for further quarantine facilities and services which should provide for efficient examination, isolation and detention of travelers.

Supervision of Health Affairs of Municipalities

The Department for the Supervision of Health Affairs of Municipalities assists local health administration, especially in matters of sanitation.

The Ministry of Health has no Department of Sanitation, Sanitary Engineer, or sanitation program. The Department for the Supervision of Health Affairs of Municipalities is the nearest approach to this activity. Sanitation, more than any other public health function, is a local or municipal activity. Ostan health officers have in some instances been responsible for the development of municipal sanitary regulations and have directed their enforcement. Some cities have required the examination and licensing of food handlers, but the examinations have been limited to the inspection of the individual without laboratory check and there has been no program of education for the food handler.

This examination program is of doubtful value. It is generally agreed now that the requirement of a health certificate for food handlers is not a sound administrative procedure. This program should be discontinued and a professionally-supervised program of market and restaurant sanitation, supplemented by the education of food handlers, should be substituted for it.

We have then, at present, in the important field of general sanitation the following situation: More than three-fourths of the population, outside the larger municipalities, are without any program of sanitation whatever; the country is without any trained sanitarians, and larger cities are doing something in this field but none has an adequate program.

In industrial sanitation, a set of regulations has been passed by the Ministry of Health and the Council of Ministers covering toilet facilities, rest room, fresh air, fire fighting, lighting, heating, drinking water, shower baths, protection against fumes and poisons, medical care, maternity leave, and other health problems.

There is also a health insurance act which requires that employees shall be insured against death and accident, with provision for medical care and insurance benefits during periods of illness or accident arising from the performance of duties. This law was passed in Aban, 1322 (November, 1943). There are approximately 300,000 workers covered by this insurance.

There is urgent need for a vigorous program of sanitation to include:

1. Development of adequately-trained personnel to include sanitary engineers at the national and ostan levels and sanitarians or sanitary inspectors for both urban and rural areas.
2. Development of national and municipal sanitary codes.
3. Installation and supervision of sanitary water and ice supplies in the large cities and the sanitation of drinking water supplies in villages.
4. Supervision of the sanitation of milk and milk products.
5. Sanitary supervision over the preparation and sale of food.
6. Sanitary disposal of excreta through the construction of sewerage systems and through privy sanitation.
7. Improvement in the sanitation of houses.
8. Sanitation of public baths.
9. Improvement of sanitation in schools and in industries.
10. Sanitary garbage and rubbish disposal.

Maternal and Child Health

The department dealing with the health of mothers and children is assigned the task of establishing prenatal and postnatal clinics, the development of well baby clinics, promotion of the health of school children, and assistance in preventing the spread of disease among all of these groups. The head of this department, with the co-operation of the Red Lion and Sun, has developed a health program in Tehran serving 250 well babies. School buildings are well used for these clinics. The program encourages breast feeding and distributes dried milk. The health examination of the babies and the instruction of mothers in infant care has proved most valuable. It serves a group in which the head of the family earns about Rls. 12,000 a year. The cost of the service rendered is about Rls. 2,000 per family. Some of these mothers receive less than 1,000 calories in their daily diet. Volunteer workers render valuable service.

So far there is no prenatal clinic, and nowhere in Iran are mothers examined in advance of delivery except in case of acute illness. Wassermann tests are given to the women who come to the clinic in Tehran, but these tests are after the birth of the baby.

Some work in general child health has also been developed by the Pediatric Hospital in Tehran and by obstetrical services in other hospitals.

There are in Iran a few hundred wealthy families who have thoroughly adequate maternal and child health services from private physicians. The few trained midwives serve the small group of middle-class people, charging up to Rls. 400 per delivery. There is no profession of public health nursing or home visitors. The development of well-baby clinics in Tehran is a splendid beginning, but it is not to be found in other sections of the country.

As we have pointed out, all but a very small proportion of the babies in Iran are delivered by untrained midwives or without any assistance to the mother, as a result of which there is a high maternal death rate from puerperal infections and hemorrhages, and a high infant death rate from neonatal tetanus and infant diarrhea. Along with this there is a high incidence of congenital syphilis. Premature births have as yet received no attention.

The most urgent need in this field is to raise, if only to a moderate degree, the quality of midwifery services to the great group of mothers throughout the country. A similar situation in Java has been appreciably improved through skillful and simple education of village midwives in cleanliness and technique. As a result, the mothers have received instruction in the elements of infant care and home sanitation. At present nearly all babies in Iran are breast fed, but most of them are nevertheless infected with intestinal diseases through lack of sanitary precautions.

The development of an adequate program, with obstetrical, midwifery, pediatric, and nursing services, should come later as the economic level rises and as trained personnel become available. It will begin in cities and gradually extend to other areas. Demonstration programs are needed under the leadership of private agencies and under public health auspices as soon as this activity can be included.

Child labor is widespread. Boys of six and older work with their fathers in silver craft. Girls and boys are in rug making. This situation cannot be suddenly eliminated. It is in the best health interests of the children and their families at present that they should work, but there is great need to improve the working conditions.

Propaganda, Publications and Health Education

The Ministry of Health does not have an organized or extensive program of health education. It does have a Director of Propaganda, but he also has a responsibility in public relations in that all mail which is received and sent by the Ministry goes through his hands.

Money for publications comes out of a general budget from which stationery and similar materials are purchased. Each year as an aid in preparing the budget the Director of Propaganda tells the Minister of Health the amount of funds he expects to use for publications. When a publication is needed, a request for a given amount of money is sent to the Minister and if funds are available the money is forthcoming. If there is excess money it may be used for special purposes, as in the current case in which the minutes of a meeting of ostan health officers are being published.

This department promotes extension courses in hygiene which meet two times a week for six months. The people who take this course are said to be mostly teachers, although there are some midwives and nurses. Teachers take it because the Ministry of Education requests any teacher who wishes to become a school principal to have had the course. No certificate or degree is given. The present course in Tehran meets Saturdays and Wednesdays at five o'clock. A visit to one of these health classes in Tehran revealed an audience of about 80 persons, some 60 or more being boys of high school age. The remainder were persons old enough to be teachers. There was one woman in the group. In Resht the class was discontinued because of poor attendance. In some of the other ostans the health officers report similar experiences.

Students take field trips to the Ministry of Health clinics. Moving pictures are shown in this course when possible. These pictures are available through the British Embassy. Other Embassies were invited in the beginning to contribute such materials, but have not done so. The Department of Propaganda has no films and no projectors.

Bulletins made from the extension course lectures are distributed free to interested persons. About two years ago a monthly health bulletin was started and run for one year, but it has not been produced during the past year.

Posters in two sizes are available on the subjects of mosquitoes, typhus, trachoma, and lice. They are the only posters available and are distributed mainly for use by Ministry of Health institutions, schools, the Army, and to some extent by restaurants and tea houses.

Some fifteen-minute radio programs have been broadcast from eight separate stations at the expense of the Ministry of Propaganda and under the direction of an assistant to the Prime Minister. The small number of families having radio sets limits the number of people reached.

There is need for the development of trained public health educators and for the development of a national health education program adapted to the needs of the people.

Arrangement of Medical Affairs

This department is concerned with regulating the practice of medicine and allied professions. It has an important public health function in restricting medical and health activities to those individuals who are properly trained to carry out these functions in an ethical manner.

Food and Drug Control

The law provides for a "Department for the supervision of drugs (including anesthetics) and the prevention of adulteration of food and medicine". Drugs including narcotics are supplied by the Ministry to its hospitals and clinics throughout the country. The administration of this activity is the chief function of this department at present.

Supplies of drugs are ordinarily sent every six months. For the Tehran area supplies are sent every three months. In some instances drugs are distributed directly from the headquarters station to individual patients who come with a permit to receive such drugs. In case of emergency or epidemic, special shipments of drugs are made to the areas involved. Health officials in the ostans complain that they are often without adequate drugs for treatment purposes and have requested the privilege of purchasing their own supplies.

There is a growing need for an adequate program for food and drug control.

Health Institute, Research and Planning

The following duties are assigned to this department in the law setting up the organization plan:

1. Testing foods and medicine for adulteration or harmful ingredients. (This activity is needed, but is not now in operation.)
2. Training public health personnel. (There are no activities along this line at present, but training programs are urgently needed, both pre-service and in-service.)
3. Research concerning methods for the prevention and cure of various diseases. (It has no such activities at present, but many practical researches suggest themselves in connection with new immunizing substances, antibiotics and specific drugs.)

4. Research upon nutritional status, food habits, and the availability of foodstuffs with special reference to babies and children. (No studies are underway at present although there is no adequate information on any one of these three topics.)
5. Making studies concerning public health needs and making suggestions concerning expansion of the program of the Ministry of Health.

Ministry of Education

There are about 2,900 public schools in the 40,000 cities, towns and villages of Iran. Many classes are very large.

The Ministry of Education reports the employment of the following staff in the field of health:

Doctors (health inspectors)	16
Eye specialists	5
Dentists	4
Doctors for treating general diseases	7
Midwives	2
Assistant doctors	9
Administrative staff	7
Servants	13

A good basic school medical program is in operation in Tehran and the Abadan area, but there is little school health service in other cities, and none in the rural areas. There is no dental program for school children. There is no nutrition program and no instruction in either nutrition or home economics. There is no health supervision of the teachers except Xrays for occasional teachers in Tehran.

The school budget carries an item for sanitation, but sanitary supervision is inadequate. There is no one responsible for school sanitation nationally.

There is some formal physical education with limited time allotment. Physical education teachers are trained in Tehran. The normal school for boys has 30 students in physical education and is equipped with a gymnasium and playing field. The girls normal school has 17 students in physical education, but no gymnasium. Basketball, volleyball, table tennis and soccer were seen at larger schools and simple tag games at smaller schools.

Limited factual instruction is carried out in some schools by the science teacher or biology teacher.

There is need for a stronger health program in schools and in teacher training institutions, developed co-operatively between education authorities and health authorities. The program should include the extension of medical service, improved sanitation, promotion of health practices, and an extended modern program of physical education.

Military Establishments

The Army has an efficient medical corps under a Surgeon General, who has a foreign medical adviser as a part of the military mission. In addition to clinical services this agency has various public health functions.

The Army, through its examination of recruits, is an important source of information on health status. Existing data in this field are being summarized, but were not available at the time this survey was made. The present examinations do not ordinarily include laboratory findings.

In the field of education the Army has a literacy program for soldiers which includes some lectures on health. The Surgeon General would welcome assistance in expanding health education and hopes that an experienced health educator may be available in connection with the Seven Year Plan.

Soldiers are vaccinated upon induction.

The personnel of the medical corps includes trained men of three types:

1. Men with a training comparable to that of a male nurse, including graduation from elementary school and training to take care of ordinary medical cases. There are about 200 men in training for this grade at the present time. They become non-commissioned officers.
2. Men with an elementary education up to Grade 9 and two years of special training giving them the qualification of assistant to the physician. There are 80 such men now in training, and their rating will go as high as First Lieutenant.
3. The fully-trained graduate physician.

The Army is very co-operative in the development of public health programs, especially in insect control. Recently it has sent a group of medical aides having the rating of junior officers to be trained in the modern use of DDT. The Surgeon General would like to expand the "Sanitary Corps" activities within his department.

The Army presents a public health problem in the field of venereal disease because recruits often become infected and represent an important source of infection in rural areas when they return at the end of their period of military service. There is need to examine all soldiers at that time, and to keep them in the Army until a cure has been effected.

The gendarmerie and the police also have medical staffs for the health supervision of their personnel.

The Iranian State Railways

The Iranian State Railways maintains its own medical and hospital service. The scope and nature of this service, as well as an indication of the distribution of disease in a typical industrial population, is seen in the statistics in Exhibit A-11 from the Railroad Health Department for the years 1325 and 1326 (1946 and 1947).

The leading physical defect in the rejection of workers is trachoma. This health service employs 350 people including 20 physicians, 8 dentists, 4 ophthalmologists and 3 laboratory technicians. There is no program of health education.

The Razi Institute

The Razi Institute was originally established because of the high incidence of rinderpest. The laboratory provided free vaccine, and in three years rinderpest was eliminated. There has been none during the last fifteen years. Some vaccine has been made, however, because the disease is present in the border areas. Five to six million doses of anthrax vaccine are manufactured here yearly.

After four years the laboratory began the preparation of vaccine against sheep-pox. Since the Department of Agriculture does not furnish veterinarian vaccinators, laymen vaccinate the sheep.

Facilities for keeping the vaccine during hot weather are lacking. Vaccinating only in the winter is impossible because some parts of the country are inaccessible. The best time for vaccinating is when the tribes have their herds assembled and ready to move. Vaccine must be made to be used in one injection and the price must be low.

The laboratory manufactures a Clostridia vaccine against gas gangrene. It also manufactures a vaccine against an animal septicemic infection. This is produced by digesting the germ with pepsin. It is an acute infection which often causes death of the animal in twelve hours.

This laboratory can make all of the vaccine needed, but it has no control over the vaccine after the product leaves it. The vaccinator service in the Department of Agriculture is entirely separate. About 1,000 men are employed but there is no district organization controlling their work.

There are no regional diagnostic laboratories in different parts of the country. Public health diagnostic laboratories might undertake this service.

There are three animal diseases of special importance to public health: anthrax, brucellosis and bovine tuberculosis.

There are many human cases of anthrax.

Brucellosis is perhaps the most serious of the three diseases. The incidence is not extremely high among village animals where new animals have not been introduced into herds. However, whenever a large dairy is established and animals are brought from different parts of the country the disease is almost certain to appear. In one herd of 150 animals recently examined, 60 per cent of the cows were infected with the organism of contagious abortion. In this case the laboratory advised the owner to kill old animals and vaccinate the young ones.

Bovine tuberculosis is widespread, especially where large herds are assembled. In the herd of cattle mentioned above, 40 per cent had tuberculosis. Some years ago a Government breeding station was stocked with 50 selected European cattle. Later four of the animals were found to have tuberculosis. The breeding station was advised to kill the animals, but would not. Last year 40 of the animals had to be killed and the station was abandoned.

Slaughter house inspection is not sufficiently thorough to examine the glands for tuberculosis. In Tehran four thousand animals may be slaughtered in a few hours. The inspectors are one veterinarian and two laymen. Owners have found that, when their animals have been diagnosed as tubercular by the laboratory and the animals have been killed later at the slaughter house, the meat was not condemned. Farmers, therefore, do not believe the laboratory diagnosis.

Little can be done at present to eradicate bovine tuberculosis because the Government provides no funds to pay the farmer for animals which should be destroyed.

The Razi Institute also makes diphtheria toxoid and tetanus toxoid. It is not equipped to make anti-toxins for these diseases at present, but is now being equipped to do so; meanwhile they are purchased abroad.

There is co-operation between this laboratory and the Pasteur Institute and each laboratory would help the other in building up a supply of any urgently-needed vaccine.

Diphtheria toxoid is said to be produced at one-sixth of the cost of the foreign product. The present product is used mostly in schools and with two injections per case. Unfortunately the Iranians do not readily accept products manufactured in Iran, but prefer any foreign product. The diphtheria and tetanus toxoids and tuberculin are turned over to the Ministry of Health.

The laboratory has a staff of 8 professional workers and a total of 70 to 80 employees, who with their families represent a community of over 300 people. The budget is Rls. 3,000,000 which comes from the Department of Agriculture and represents the tax levied for the inspection of Persian lamb skins, minus the cost of such inspections.

VOLUNTARY AGENCIES

In every country voluntary agencies are playing an increasing part in promoting the public health. Being independent, free from political influence, under the leadership of public-spirited citizens, and under a central and direct administration, they are efficient and effective. Their budget is usually supplied from accumulated wealth or from charity, and their operation does not constitute a drain upon the tax structure. These voluntary agencies can undertake certain functions which are difficult for government. They are especially valuable in pioneering in new fields where their experimentation and demonstration prepares the way for government activities.

These agencies render such valuable service and their relationship to government is so important that state and national health counsels, which represent all national health agencies, are developing around the world. They plan for national health, co-ordinate the health activities of all government ministries concerned with health, as well as those of the voluntary organizations and foundations.

Imperial Social Service Organization

This Organization is under the supervision and chairmanship of His Imperial Majesty the Shah and under the Presidency of Her Royal Highness Princess Ashraf Pahlevi. It was established less than two years ago. Its activities are as follows:

This Organization has already developed 34 dispensaries in rural areas and its plan calls for 5 dispensaries in each ostan, or 50 altogether. In the isolated villages where these dispensaries are established, they have provided the people with their first experience with modern medicine. It is hoped that a hospital and laboratory may be provided in the capital of each ostan to serve the five field centers.

The staff of each dispensary consists of a physician, a midwife, three nurses (one graduate, one experienced and one certified nurse, either male or female), plus two local people who are being trained for general patient care, vaccinations, and simple medications. The latter are paid Rls. 500 a month for two years and the Organization will later employ them if they are suitable. One gardener and houseboy and one general servant are also employed at each dispensary.

The physician is paid a minimum of Rls. 10,000 a month, but bonuses may be added for locations in poor climates, so that the minimum may go as high as Rls. 16,000. In one location on an island in the Gulf it was necessary to pay Rls. 25,000 a month the first year in order to get a doctor to go there. Rls. 1,000 a year are added, but for three-years' service in a poor climate Rls. 3,000 per year are paid from the beginning. The Parliament passed a bill placing the employees on civil service, thus providing Government rank and making the employees eligible to participate in the Government pension system.

In addition to the physician's salary, a house and furniture and a servant are provided. The doctor's only expense is for food and personal items. One month vacation is provided yearly and is cumulative for three years, at which time the person who has not used his vacation may have either three months of vacation or three months' pay.

In order to increase the number of trained doctors and midwives a plan is made to enter into a contract with students to come to Tehran for study and serve the Organization for three years after graduation. The medical student will be paid Rls. 800 a month the fourth year, Rls. 1,000 a month the fifth, and Rls. 1,200 a month for the sixth year. It is planned to enter into contracts with girls from the ostans to come to Tehran and study midwifery.

It is realized that prophylaxis is needed at present, so vaccination for smallpox and diphtheria have been carried out in connection with these centers, although the Organization prefers eventually to confine its activities to treatment.

In the beginning the Organization requested local communities to give 2,000 square meters of land and to supply water. At first communities were hesitant, but now over 250 places have offered land and water and also some money. Some philanthropists have given buildings which are being used for dispensaries. Over 300,000 people have received help in the last 18 months.

There are two local laymen and a physician on the Board of Direction and Planning for each dispensary. At the ostan level there is a board of 12 men, under the chairmanship of the Governor General, which supervises the local units. The health officer of the ostan is on that board. The other members are not specified. At the ostan level the Organization has drugs which are sent to the dispensaries as needed. The doctors must work six hours a day, but they are free to practice medicine outside that time.

As indicated in the discussion of personnel, 60 students will be accepted in the first class of the new School of Nursing and the program will be initiated within the next few months. These girls have eleven grades of school upon entering and will stay in the nursing school for three years. Plans are made that some of these bedside nurses may take a graduate year to train themselves for midwifery in the ostans.

The cost of Rls. 15,000,000 for the building was supplemented by Rls. 2,000,000 for equipment. The Anglo-Iranian Oil Company will pay the expense of the staff, and the medical school will pay student expenses including food, books and some pocket money. The budget is anticipated to be Rls. 1,500,000 annually.

Plans are under way at present for a school of public health nursing through the co-operation of the Rockefeller Foundation. The plan for this program is similar, in that the Organization will put up the building, the Rockefeller Foundation will pay the salaries, and the medical school and the Ministry of Health will pay the student expenses, which will amount to about Rls. 500 per student per month.

Tehran and vicinity, with over a million population, has only 2,000 hospital beds. There are no facilities for emergency care, so the Organization is starting a center with 100 beds and an ambulance service. It expects to do 10 to 15 operations a day and to operate a blood transfusion service. Patients will be moved to regular hospitals under appropriate circumstances.

The Organization has a program for operating four maternal and child health dispensaries at different points in Tehran. This type of service carries prenatal and post partum advisory service and gives clothing, soap and some powdered milk for infants.

A technical school serves about 70 middle class boys, teaching carpentry, electrical work, and other skilled trades. This school is similar in method to those of the Anglo-Iranian Oil Company in Abadan. It is hoped to increase the capacity of the school to 300 students. This is not exactly a health activity, but it is important to the Seven Year Plan because the bottleneck of industrial expansion is likely to be a shortage of skilled workers.

An important program is in operation at the Work Center for Beggars and Vagabonds, which is caring for 2,600 persons, or half of the beggars in Tehran. It has a health aspect because many of the persons brought to this center have syphilis, ringworm, or some other infection. Others are psychopathic. The social significance of this activity is obvious. Operating costs are kept to about Rls. 20 a day per person, not including building costs. Beggars and vagabond children are collected by the agency. About 700 of the inmates are children. There are nurseries for those from two to five years of age and study classes half of each day for those of seven years or older. The adults and older children do carpentry, rug making, and other types of work. They receive Rls. 10 to Rls. 15 per day in addition to food and lodging. From this, the average person spends about Rls. 3 per day and saves the rest. This program was planned following a careful study of the different types of beggars.

The Center has different sections for families, for the crippled and sick, for orphan children and for healthy men and women.

When individuals come to the Center, first attention is given to health and preventing the spread of infection. The individual is given a uniform and a social history is taken. Three-fourths of these persons are addicted to opium to some extent, and about 10,000 persons have been treated for opium addiction at the Center thus far. Six hundred persons have been treated for ringworm. Most of these beggars have scabies, and tuberculosis and trachoma, as well as syphilis, are common. All of these conditions are treated. The extension of the 40-bed hospital is necessary, although many are treated in a clinic for ambulatory patients.

Thousands of persons are constantly passing through this work center. A few have been found to have money and leave under proper custody to prevent them from returning to begging. Some of these agree, with the signature of a sponsor, that they will not beg again, or, if they do, will pay Rls. 5,000. Some 700 men were sent south to work on roads. Those who have had a trade are rehabilitated and returned to it.

A deep well has been successfully dug which furnishes ample water for the Center and the adjoining area.

Special Programs

Special programs against malaria in Baluchistan and a special program for sanitation and combating trachoma in Dizful have been initiated and are being carried forward with the co-operation of other agencies.

This Organization has also co-operated with Government and other agencies in special projects for the care of the tuberculous poor, the furnishing of drugs for the treatment of venereal disease, the prevention of cruelty to animals, and assistance to orphans and foundlings.

Overnight care for homeless persons in winter months has been developed in six buildings in Tehran. A similar special project is the furnishing of charcoal, bread and clothing for poor people.

Budget

This Organization has a budget of nearly Rls. 100,000,000 a year. The largest single source of revenue, providing some Rls. 60,000,000, is the income from a group of villages turned over to the Government by the royal family. Certain import duties upon luxuries provide another Rls. 10,000,000. The national lottery provides about Rls. 20,000,000 per year (the national lottery nets about Rls. 60,000,000 annually, but about 20 per cent of this goes to The Red Lion and Sun, 20 to private agencies for maternal and child health, 7 to certain historical shrines, and 15 to the Agricultural Bank for services to peasants). Contributions of private philanthropists are increasing and now amount to about Rls. 5,000,000 per year. The Organization is efficiently administered. It began with volunteer workers and a fine spirit of service has been maintained.

The Society for the Prevention of Tuberculosis

This organization is made up of capable physicians and lay persons with a special interest in tuberculosis. It is a relatively new organization with a limited budget, but with constructive plans.

It aims to increase hospital, sanitorium and clinic facilities, to train specialists, to carry on health education, and to assist the poor in getting necessary care.

The Society for the Prevention of Venereal Disease

This organization has a budget of about Rls. 15,000 a month from the Imperial Social Service Organization and has sought to raise other funds through private donations by means of coin containers in buses. Only about Rls. 5,000 per month have been collected to date.

The Society co-operates closely with the Ministry of Health. It is a source of information concerning the present venereal disease situation and it promotes the quality of professional services in this field.

A treatment clinic is now being operated in Tehran. This is not a prophylactic clinic although such a clinic is needed.

The Society also supplies drugs for some Ministry of Health clinics. It plans the extension of its program with the establishment of a venereal disease clinic in each ostan, and the expansion of its educational activities.

A private hospital of sixty beds in Tehran has about 30 beds available for venereal disease patients. Infected prostitutes are isolated in a 14-bed ward. The Society estimates that there are at present 4,000 prostitutes in Tehran in the Sharenow area, plus an unknown number of individual prostitutes who live in other parts of the city.

It is reported that prostitutes from the Sharenow area are supposed to go for examination every two weeks. However, only about 40 smears are made a day in the laboratory and this includes smears from all patients. Obviously the number of prostitutes reporting for examination is small. Observation of the skin and throat is made for symptoms of syphilis. Wassermann tests are made only when the disease is suspected. No dark-field examinations are made to detect spirochetes in initial lesions.

The Society hopes to assist in gathering more exact data concerning venereal disease incidence, to promote rapid treatment programs, to increase the facilities for training venereal disease specialists, and to increase the public awareness of the problem.

The Red Lion and Sun

This organization, under the sponsorship of His Imperial Majesty the Shah and the presidency of Her Royal Highness Princess Shams Pahlevi, is similar to the Red Cross in other countries, providing nursing services in time of war and having an important program of disaster relief. Founded about twenty-five years ago and recently reorganized, it is well administered and expanding rapidly. Its work is now largely centered in Tehran.

The health program of the Red Lion and Sun includes important activities in health education, especially in the field of home nursing and child care, through organized classes of youths.

Other activities are the establishment of homes and centers for orphan children, the promotion of maternal and child health, and the establishment of first aid centers.

The League Against Opium and Alcohol

This organization is interested in the fight against the use of opium and alcohol and somewhat less directly in the general problem of mental health. It has made a considerable study of the opium and drug problem and is promoting a program for the abolition of the growing of poppies, which has been advocated by Iran at the International Conferences on Opium Control.

The League treats opium addicts. The treatment used is fairly satisfactory; it consists of the administration of tablets over a period of several weeks. The tablets look alike, but they are not. Those taken at first supply nearly as much opium as the patient has been taking, but gradually the amount of opium is decreased and a stimulant is added in increasing amounts; then the stimulant is gradually decreased. Cases which relapse say that they would get on very well without opium if they did not see it around.

The maximum amount of opium which the world can use for medicinal purposes is 300 tons per year. Iran raises over 800 tons. The world now has enough for medicinal purposes for the next ten years. There are, moreover, synthetic drugs for medicinal use which have been and are being produced in increasing quantities.

Although the International Conference on Narcotics suggested limitation of poppy growing, Iran fought vigorously for its abolition. Iran has also communicated with the neighboring countries of Afghanistan, Hindustan and Turkey, seeking their co-operation in the fight against opium smoking.

The alcohol problem is less serious than the opium problem, but it is increasing in importance and needs to be combated through education.

Professional Associations

There is a well-organized medical society in Iran as well as separate associations of dentists, midwives, and pharmacists.

Foundations

Three foundations, The Near East Foundation, The Iran Foundation, and the Rockefeller Foundation, are carrying on important activities in the health field.

The Near East Foundation

The work of the Near East Foundation deserves special consideration because, like the Seven Year Plan, it has approached the problem of rural betterment from the standpoint of agriculture, education, and health.

The entire activities of the Foundation have been centered in an experiment in the Veramin district, 30 kilometers southeast of Tehran. The work began in 1324 (1945) in five villages and has now been extended to include 35. The Ministries of Agriculture, Education, and Health have co-operated in the conduct of this project.

Activities in the field of agriculture have been concerned with the improvement of domestic animals and the development of more diverse and better agricultural crops. In the field of education, village schools have been established and expanded, a training course for village teachers is now being conducted and summer workshops for teachers have been operated during the vacation period.

Health activities have dealt mainly with the improvement of sanitation, including insect control. Under the agreement between the Near East Foundation and the Government, technical personnel can be borrowed from the respective ministries; the Foundation adds a stipend to the regular salary of such personnel.

The major health activity has been in the field of malaria control, which is now extended to the 7,000 people in the 35 villages, having a combined farming area of about 18,000 hectares. In developing malaria control, visits were made to the respective villages to talk with the mayor or representative of the landowner, and conferences were arranged with the landlords themselves to explain the health program. The inside of all of the dwellings and animal quarters were sprayed with DDT in kerosene, at a cost for materials somewhat below Rls. 50 per spraying per family. These costs did not include the transportation of materials, or labor, which the villagers are glad to contribute. Exact data are not available concerning the reduction in the amount of malaria, but it has been sharp and is estimated at about 85 per cent. Spraying has been done at the beginning of the malarial season and again in midsummer.

In the matter of insect control, through the use of DDT, it should be pointed out that lice, flies, ticks, bedbugs, sand flies and house flies are suppressed as well as mosquitoes. The clothing and bedding are put on the floor when the spraying is done. If there is a problem of lice control the people are also dusted with DDT powder. The spraying in Ordibehesht (May) and Tir (July) eradicates nearly all of these insects. Animals are dusted with

10 per cent DDT and ashes. There is one tick which is not susceptible even to 100 per cent DDT but is killed by the usual sheep-dip.

Improvements have been effected in excreta disposal. At the beginning of the experiment there were only one or two latrines in the original five villages. They were dirty and a source of fly breeding. Most families used no latrine at all. The plan has been to dig deep "dry well" latrines, about 10 meters deep and one meter in diameter. These dry wells are expanded at the bottom into a space of about two meters square. Concrete slabs for latrine covers are made on a standard form at a cost of about Rls. 50 each. The Foundation pays for the slab and the men of the family dig the latrine. Since the latrines are deep and dark, fly breeding does not occur in them. In many cases a mud and straw shelter has been erected over the latrine.

Animals are kept near the houses because jackals and half-wild dogs would endanger them if kept in a barn at the edge of the village, and such a barn would have to have a watchman. Fly breeding from animal manure is said not to be a serious problem because the manure dries too quickly to allow flies to breed in it. Much of the manure is used for fuel. Experience indicates that the chief fly-breeding danger was in the old unsanitary latrines.

Village sanitation has also included leveling of the land, cleaning of the jube and the removal of animal manure from the streets.

Steps are under way to improve the quality of the water supply. In the past, river water from the jube has been used for all purposes. In the winter and spring there is a considerable flow of water, but in the summer the stream is turned into each village only once in 15 days. The village supply is held in an underground tank where the dirt settles out, but there is no purification.

To improve this situation the water has been led through a coarse sand and gravel filter, consisting of three feet of broken stone, graded to gravel and covered with about one foot of sand. From this filter the water runs to a tank, or ab-ambar, in two sections with a brick partition between. The water filters from one chamber through the brick partition into the other, from which it is withdrawn through a faucet. The villagers walk down a flight of stairs to get at the lower level, from which the water runs through the faucet by gravity. Bacterial analysis shows some B. coli in the river but none in the final product.

Some of the villages have kanat water, which is fairly pure before it is discharged into the open jubes. One plan has been to build an ab-ambar near the kanat, large enough to hold two or three days' water supply, to fill this chamber early in the morning and to run this supply eventually to two or three places in the village. Usually the kanat belongs to only one village and brings water directly to it from the hills. In some cases it may be possible to have a shallow well at the upper edge of the village which could be used for drinking water.

In one village a deep well has been drilled to tap the water table. Seepage water was struck at a depth of seven meters. The well was then drilled to a depth of 50 meters, sending the casing through the bedrock. This well yields an ample supply; in a test 57,000 liters of water per hour were pumped for 16 hours. The water level dropped 4 meters during the first few hours, then held steady. Ten minutes after the pumping stopped the water was at the original level. This test was made in the dry season.

Development of housing consisted of the construction of a three-room mud and straw house at a cost of Rls. 12,000. The house has one living room for eating and sleeping, with a charcoal heater and rugs, and a brick floor. The kitchen is a separate completely enclosed room, with a storage room between the living room and the kitchen in common with the usual Iranian custom. An improved stove in the kitchen burns either dung or weeds. This house contains two windows in the living room and one in each of the other rooms; it has wide doors and a porch. A model latrine and latrine building were provided. The cost of straw, brick, wood and windows would now be about Rls. 9,000 and labor might run as high as Rls. 5,000, making a present cost of about Rls. 14,000.

A vaccination program against smallpox has been carried out with the aid of a physician secured from the Ministry of Health.

Dietary improvement has been secured through persuading villagers to grow green vegetables. Traditionally, each farmer grows only one crop. The standard diet has been bread made from whole wheat flour ground in a crude mill. In addition mast (a boiled and subsequently fermented cows' milk or goats' milk) is regularly eaten, although this product is too expensive for many villagers. Everyone drinks tea. Meat is eaten once or twice a week. Pomegranates, apricots and a few grapes are raised in this area. Some eggs are produced, but they are usually sold as a cash crop. Last year people raised and enjoyed tomatoes and eggplant. Blackeyed peas are fairly commonly eaten, as they grow well along the sides of the jube. The school garden has helped to promote the raising of vegetables.

Plans for substituting shower baths for the unsanitary public tank are under way. The new baths will carry an overhead tank with a hot and cold water control. The danger of the present public bath was explained to the villagers, who said they knew that skin infections and dysentery may come from this bath. They were not inhibited by religious beliefs and voted for the new style bath.

Health education has been undertaken along various lines. The villagers were told the facts about malaria and the suppression ' insects with DDT. A model latrine and sound sanitary methods have been developed in connection with the village schools. Chlorinated water is distributed from the school water tank. Children have their individual cups and individual towels. The school for teacher training and the summer workshops both have a strong health emphasis.

One of the important contributions to this experiment has been the training of young Iranian men in spraying techniques and in sanitation. No health councils have been organized as such, but meetings of villagers have been held, sometimes with a two-hour tea party and a lengthy discussion. This is a new type of meeting for the villagers, who have enjoyed it. The mullah has come to some of these meetings and is an important factor in health education.

It should be mentioned that an adult educational program for literacy and for the teaching of reading, writing and arithmetic also gives instruction in hygiene and in agriculture.

Landlords were generally pleased with the work of the Foundation but very hesitant to spend money on this type of activity. The villagers, however, are increasingly happy to participate in the improvement of the environs.

The Iran Foundation

The recently organized Iran Foundation contemplates the construction and operation of a model hospital in Shiraz as a major project. Its Director has been trained in the United States, not only in medicine but also in public health, being a graduate of the Johns Hopkins School of Public Health. Both the Director and the governing board of the Foundation are interested in public health. It may be expected that its contributions in the health field will be considerable in aiding special projects, the training of professional personnel, the development of health educational material, and the conduct of special field studies.

This last-mentioned type of activity is particularly important since Iran lacks statistical data from field studies of typical groups in such matters as the extent of dietary deficiency diseases, intestinal worm diseases, tuberculosis infection, infant diseases and deaths, and syphilitic infection. Moreover a public health expert, like the Director, can be very useful in national planning for health promotion.

The Rockefeller Foundation

The Rockefeller Foundation now has a resident public health specialist in Iran who is working on plans for developing a model program of local health administration near Tehran. Such a program should prove to be of tremendous value in fact finding, the development of administrative public health methods, and the training of public health workers.

As indicated elsewhere herein, plans for the development of a school of public health nursing are also under consideration.

The Foundation now has one Iranian physician studying in the United States under a fellowship, and offered, early in the fall of 1327 (1948), a fellowship in epidemiology, one in biostatistics, and one in public health engineering for 1328-1329.

The advisory services of experts in public health administration, malaria control, public health nursing, and other fields is available from time to time as members of the Foundation staff have opportunity to visit Iran. The resident expert will be of increasing value in the planning of national health programs.

SUMMARY OF PUBLIC HEALTH NEEDS

In connection with the discussion of present activities we have indicated certain related needs. Certain outstanding needs have been most obvious throughout this discussion. Iran does not have a modern program of public health and preventive medicine. Present Ministry of Health activities are confined to about 300 cities and large towns and are almost entirely limited to medical care. Over 40,000 villages and the nomadic tribes are without medical or public health services. There is no personnel trained in public health. There is a severe lack of sanitation and an equally serious lack of health knowledge among the mass of people. Certain diseases present particularly acute problems.

Many of the public health needs have been clearly recognized by public health personnel as illustrated by the following recommendations selected from the list of proposals made to the Ministry of Health by the first conference of ostan health officers, city health officers, and quarantine officers held in Tehran about a year ago:

1. Turn over hospitals and dispensaries to private agencies and municipalities.
2. Use not more than one-fifth of Ministry of Health budget for Tehran and make remainder available to the ostan health departments on a per capita basis at the beginning of each year.
3. Plan and execute a more vigorous program against malaria, trachoma, typhoid fever, tuberculosis, relapsing fever, typhus, diphtheria and smallpox.
4. Send funds available for the purchase of drugs to each ostan annually in proportion to population.
5. Establish a public health laboratory in the center of each ostan.
6. Construct residences for physicians who are sent to rural stations.
7. The title of "vaccinator" should be changed and the work broadened in scope.
8. Since venereal diseases are widespread and important, and since there is an adequate law which can be put into effect at the discretion of the health officer, it is recommended that drugs and facilities be made available to those health officers who wish to undertake venereal disease control.
9. Enact a sanitary code.
10. Provide a higher salary scale for certain technical personnel.

It is recognized also that health improvement depends, in part, upon situations outside the control of public health personnel. Many health officers have made such comments to us as: "We cannot make progress in the face of so great poverty and ignorance." "We can't handle the health problems in our district until we get highways upon which we can move." "Public health progress is held back by lack of transportation and communication." Fortunately, these other factors are receiving consideration in the Seven Year Plan.

We have shown the present organization of the Ministry of Health in Exhibit A-7 as set up under the law of 22 Azar 1324. Jointly the Ministry and the Plan Organization should study the duties of the Ministry for the purpose of clearly defining the functions that are to be undertaken by the respective agencies under the Seven Year Plan program of public health. Within the Ministry itself a separation should be made between the treatment activities and the public health activities. In accordance with the recommendations of the above-mentioned conference on public health, the hospitals and dispensaries should eventually be placed under the control of municipalities and private agencies. Consideration should be given to the elimination of the Inspection Division and the placing of its responsibilities upon the respective administrative heads. Separate divisions probably would be desirable for the functions of sanitation and public health laboratories. The recommendations in the following chapter indicate the nature and extent of the co-operation needed between the Ministry of Health and the Plan Organization.

PROPOSED PUBLIC HEALTH PROGRAM

The following proposals are based upon a careful study of the present activities of the Ministry of Health, extensive field visits from the Caspian Sea to the Persian Gulf, conferences with medical and health personnel, and study of the suggestions of the Health Advisory Committee to the Provisional Planning Board. There has been an agreement in principle upon these proposals in a four-day conference with representatives of all the national health agencies of Iran, both official (civilian and military), and voluntary.

BASIS OF RECOMMENDATIONS

Our function respecting the public health program of the Seven Year Plan is to determine and recommend to the Plan Organization those activities which seem most desirable. The preparation of detailed plans and detailed budgets would be impossible now for many reasons. The exact location of projects cannot now be determined in many cases. It is likely that local governments will be strengthened. Their participation as well as that of voluntary agencies will have to be determined in the future. In many projects, as for example in malaria control, experimentation may lead to changes in methods and consequent changes in costs.

The basis we have used for selecting public health projects to be carried out under the Seven Year Plan is as follows:

1. Projects selected must be in the field of disease prevention. The law restricts this program to prophylaxis, which includes curative medicine only when it is necessary in order to reduce or eliminate foci of infection.
2. Projects must be subject to the technical and financial control of the Seven Year Plan. The Plan cannot participate in any program of other agencies where financial and technical control would be impossible. Its projects may be either new activities or the extension of existing activities where either direct operation or technical and financial supervision is possible.
3. Special consideration must be given to the development of health programs in areas and localities where major Seven Year Plan projects are undertaken in industry and agriculture. It would be most unfortunate if new agricultural or industrial plans should fail or falter because the health of the people was poor. On the contrary, the public health section must contribute to the success of all projects by protecting and raising the health and vitality of the people concerned.
4. Those projects should be selected which, for the money available, will give the most prompt and extensive improvement in the national health. Definite and prompt improvement in the public health is essential. Money should not be allocated to the erection of buildings except where those buildings are necessary to the operation of a program of disease prevention. At best the construction capacity of the nation will be severely taxed by the building of new facilities urgently needed in the Seven Year Plan. The major attack can and should be upon specific diseases in situations where the problems are acute and where definite improvement can be secured. Programs which will have permanent benefits are to be preferred over those which will produce only temporary or transient health improvement. While it is desirable to develop public health activities in as many areas of the country as possible, projects which will produce prompt results and demonstrate possibilities of prophylaxis take precedence over any attempt to produce a uniform national health program.

ORGANIZATION AND PERSONNEL

Because the present Ministry of Health is primarily a treatment agency, it has been agreed between the Ministry of Health and the Plan Organization that it is desirable for the Plan to undertake certain public health activities and develop them into smoothly functioning programs before they are turned over to the Ministry. The question of when public health projects should be turned over to the Ministry cannot be decided in advance.

There has been some discussion concerning the desirability of having the Ministry of Health turn over to the Plan Organization those few public health activities which it does have. The Ministry of Health would then become a Department of Hospitals and Public Assistance and the public health activities in the Seven Year Plan would eventually become a Ministry of Public Health. Such a procedure, however, is hardly in accord with the present concept of Seven Year Plan administration. In any case such a decision is one for the Government and is not contemplated in the projects here proposed.

There must be joint planning between the Plan Organization, the Ministry of Health and all national health agencies in order that all Governmental and voluntary health agencies may serve to the best advantage. The four-day conference held in Farvardin, 1328 (April, 1949), in which the major national health agencies all worked on the prospective Seven Year Plan health program, showed both the importance and the possibilities of joint planning. There is every reason to believe that such co-operation can be continued.

The personnel organization, with special reference to the use of foreign specialists, will follow the general pattern of the Seven Year Plan, which contemplates using such specialists only as long as they are essential and until such time as the technical or administrative responsibilities can be turned over to Iranians who have been adequately trained. Personnel must be set up at both the national and ostan or regional levels.

Public health leadership of the highest quality is needed in directing this program. It is also of the greatest importance that political interference should not hinder its development. This means that the man responsible for administration should have freedom in selecting and dismissing personnel. Under the Plan it is possible to borrow technical employees from the Government service and place them on the payroll of the Plan. In every case, however, the Plan and not the Ministry should determine what individuals are to be borrowed and the duration of their service with the Plan. Most technical employees of the Plan should be full time although in certain cases it is appropriate to secure part of the time of certain specialists.

Other agencies, both voluntary and Governmental, have salary scales for technical personnel appreciably higher than that of the Ministry of Health. The Seven Year Plan must have a sufficiently high salary scale, carefully planned, and with sharp and adequate differentials for men located at varying distances from Tehran and in areas where the climate is less desirable.

The difficulty that would be caused by borrowing a man from the Ministry, putting him on a higher salary, and eventually returning him to his former low salary scale, can be avoided by raising the salaries in the Ministry. Looking to the future vital public health needs of the country, the Ministry must be given a salary scale commensurate with that necessary to obtain and hold competent personnel in the Plan Organization.

The direction of the program at the national level demands the services of a completely trained public health expert, who has had extensive administrative experience in directing public programs including, if possible, experience in problems of the type found in Iran. Such a man could be directly employed by the Government or he could come as the technical adviser to an Iranian who would have the administrative responsibility. In either case he should be in Iran from five to seven years to guarantee administrative continuity. Unless an Iranian administrator is available who has had public health training and experience and who can be relied upon to resist political pressures and to work effectively with the foreign expert, the latter ought to be employed to administer the program.

The Seven Year Plan will have a regional office in each ostan or area for administrative purposes, in which will be located representatives for the various Plan activities. In activities for which there are no Iranians already trained, foreign specialists will be assigned for a period of two or three years to work with Iranians who will then take over responsibility. In the case of health administration the foreign specialists should be young, well trained public health administrators, each of whom will work with an Iranian physician in directing the preventive medicine activities of the region. This Iranan physician will direct ostan activities of the Seven Year Plan after the foreign adviser is withdrawn. He would naturally become an assistant ostan health officer or a municipal health officer when Seven Year Plan activities are turned over to the Ministry of Health.

Because sanitation is a major activity and because Iran has no public health engineers or sanitarians, a similar organization is needed in this field. This requires a highly trained and experienced public health engineer on the national level, who has had experience in malarial engineering and in environmental control in situations similar to those in Iran. He will work for five years with an Iranian engineer, who will then take over. In each regional office there must be a young, foreign, well-trained sanitarian who will work for two years with a young Iranian engineer.

One other field needs a person with a type of training not to be found in Iran, namely health education. A foreign, well-trained health educator is needed at the national level. Such a person is thoroughly trained in education and in public health education methods, with a sound basic public health training in a school of public health. The person needed here must have had considerable practical experience. This person should stay in Iran for five years before turning over the program to the Iranian who works with him.

It is believed that foreign public health educators will not be needed at the ostan level. Suitable Iranians can be selected, who by means of a two or three month training course under the foreign health educator in Tehran should be able to carry on well-planned regional programs. Such health educators in other countries are usually young men and young women soundly trained in basic science and education, who have had special training in hygiene and public health in a school of public health. In Iran it will apparently be necessary to select either physicians with an interest and aptitude in education, or biology teachers or physical education teachers with special training and interest in health, and with a flare for public relations and health propaganda.

It thus appears that three highly trained foreign experts are needed on the national level for five years, plus ten young health officers for three years and ten young sanitarians for two years, each working with an Iranian counterpart.

Additional technical personnel will be provided from within the country for the following positions:

1. Iranian specialists in the various fields of public health who will first be sent abroad for study.
2. Physicians who will be trained in Iran to administer new local health units.

3. Laboratory directors and technicians who will be trained as needed.
4. Male nurses or medical aids, to assist in health centers, who will be trained as needed.
5. Sanitarians for village work who must be trained to direct anti-malaria activities and to improve general sanitation. These must be village boys who are willing to live and work in the villages. They can also be trained to vaccinate in rural areas. Some of the present staff of vaccinators can be given training in sanitation and used for this purpose. As medical and nursing personnel become more widely distributed they will naturally take over vaccination activities. The broadly trained sanitarian-vaccinators will continue as sanitarians and those trained for vaccination only will be used as hospital orderlies or in some other capacity.
6. Midwives who must be trained at once to assist in reducing the high maternal and infant death rate due to lack of proper care at child birth and lack of advice in infant care.

In setting up the following separate projects we shall indicate the nature of the project, the reasons for its selection, the extent and geographic distribution of the activity, relationship to other Plan activities if any, the general magnitude of the budget requirements, and whether the project is one for immediate or deferred action. In general the emphasis in the early months of the program will be placed upon the training of personnel, the suppression of malaria, general sanitation, widespread vaccination against smallpox and typhoid fever, trachoma control, health education, and initial steps in combatting tuberculosis and syphilis.

These activities are selected for early emphasis because they will achieve the most rapid reduction in diseases and deaths, raise working efficiency most rapidly, convince the people of the efficiency of Plan activities, and lay the best basis for a continuing public health program.

Personnel training must begin immediately. The new program activities can go forward only as adequately trained personnel become available, but in this chapter personnel training will be discussed last after we have outlined the work that is to be done.

MALARIA PREVENTION

The reasons for giving highest priority to malaria prevention are clear. It constitutes the most serious public health problem in Iran. Moreover, the modern intensive and skillful use of DDT combats other mosquito-borne diseases, as well as "tropical sore" and "3-day fever" which are carried by the sandfly. DDT also kills house flies which are important in the transmission of infant diarrhea, trachoma, typhoid fever, dysentery and other intestinal infections. In fact, recent DDT campaigns in Sardinia have produced an appreciable reduction in both infant diarrhea and trachoma. Moreover DDT is also an effective weapon against the louse, a widely distributed parasite which carries typhus fever and relapsing fever. Bedding and clothing are spread on the floor when the house is sprayed and 10 per cent DDT powder may also be used against lice.

Malaria control on a national scale is therefore to be undertaken at once because the disease is so widespread, because it incapacitates millions, masks other diseases, and can be reduced rapidly by modern methods, and because DDT spraying will also reduce other diseases.

A beginning has already been made in malaria control by the work of the Near East Foundation and by the current activities of the Ministry of Health. This program can best be carried forward by the Seven Year Plan because the Ministry of Health has no public health engineer or division of sanitation, and because neither the Ministry nor any other agency has adequate available funds to handle this project.

The program of malaria prevention will make appropriate use of all modern methods, but the primary weapon will be the spraying of all houses and barns with DDT in order to break the chain of infection by killing the adult mosquito. The killing of larvae by the use of oil or larvacides will not usually be undertaken. The use of drugs, the use of minnows, and the control of surface water will be considered after we discuss the major activity of DDT spraying.

To date the general practice has been to spray two times a year with a five per cent solution of DDT in kerosene. The experience of the Near East Foundation and the studies in Iran by Dr. Justin M. Andrews of the United States Public Health Service show the cost per house of each spraying (tax-free kerosene, equipment, supervision, labor and transportation) with 100 per cent technical DDT in kerosene to be approximately Rls. 50. If the Government tax on kerosene must be paid, the cost will be increased to about Rls. 60. Thus the cost of two kerosene sprayings per year would be Rls. 100 per house or more or Rls. 120 if the tax is payable.

It may be possible to use water-wettable DDT to avoid the cost of kerosene. The cost of an application of 50 per cent water-wettable DDT is estimated by Dr. Andrews at Rls. 57.5 per house. Using the somewhat less satisfactory 90 per cent water-wettable DDT will cost about Rls. 45 per house for each application.

Experiments this summer will disclose whether it is possible as it has been in other countries, to use one spraying a year instead of two. The sprayings may be necessary because of the intense heat, the presence of smoke from open fires in the houses of the peasants, the accumulation of creosote on the ceiling, or the settling of dust on the walls and ceiling.

It is thus possible that in 1329 (1950) the average cost of spraying per house may be cut by 40 to 50 per cent. For the present we must assume the cost to be at least Rls. 100 per house.

The extent of the spraying program the second year of the Plan will be determined by the extent of the Ministry of Health program this summer and by the extent by which supervisory personnel can be trained before the spring of 1329.

Dr. Andrews suggested that a total of 350,000 houses could be sprayed in 1329, 620,000 in 1330 and 880,000 in 1331. This is a large undertaking from the standpoint of both expense and personnel. There will also be an initial expense of about Rls. 10,000,000 in the early months of the program for the purchase of trucks. The needed personnel will, for the most part, also serve the general sanitation program and to some extent the immunization program, although malaria control will have major emphasis.

Personnel should include:

A well-trained foreign public health engineer with experience in malaria control to serve at the national level with an Iranian engineer.

Ten young foreign public health engineers or sanitarians to serve in the ten different ostans, each with an Iranian sanitarian.

Eventually 400 sanitarian-vaccinators to work in the villages.

A medical malariologist and entomologist (who may be available from the World Health Organization).

Allocations of the budget for personnel salaries and expenses, as well as spraying costs, are shown in Exhibit A-12.

In the Caspian area where silk worms are raised it is impossible to spray DDT in or near the houses where the silk worms are grown. Perhaps spraying may be found to be possible after the worms have been grown, but it seems likely that enough DDT would be left on the walls to injure the next year's crop. In some of these areas silk worms are grown in separate buildings and this practice may be extended. It is desirable, however, to experiment with one of the new anti-malarial drugs which will prevent the development of symptoms and thus keep people well through the malarial season. It will not cure or permanently prevent certain types of malaria. The drug may be distributed by the sanitarian-vaccinators.

An annual cost of Rls. 3,000,000 is estimated for the use of drugs, based on 100,000 persons in the Caspian area at Rls. 0.293 per tablet for 90 tablets of chlorguanide or paludrine. (Rls. 30 per person).

The other expense item is the cost of raising and supplying larva-eating minnows (Gambusia affinis) for use in private pools and cisterns. These fish are being used successfully in southern Iran and in many other parts of the world. A nursery to grow them is recommended for each ostan. The total expense of supplying them is estimated at Rls. 500,000 per year.

Irrigation, drainage and water supervision will receive attention, but will not involve additional expense. New projects of irrigation in dry areas and improved irrigation in rice areas will both be considered with respect to mosquito control under the direction of the sanitary engineer. Special emphasis will be placed on the production of water-tight systems, so that water will not stand in drainage ditches for more than one week where it can be avoided. It has been found that rice can be successfully cultivated with intermittent drying and flooding, or with two systems of irrigation—one being dry and the alternate one full of water at any particular time. Education will be used to get better water control, by avoiding pools formed by leakage from the system and cleaning grass from the edges of ditches.

Permanent drainage will doubtless be carried forward by some municipalities and private agencies. The sanitary engineers will furnish professional advice for this program, but the Plan will not allocate money to it.

Public health laboratories are needed in the program of malaria control. Such laboratories serve many other public health purposes and separate provision is made for them.

A total of Rls. 339,934,000 is allocated for malaria control from the Seven Year Plan. As shown in Exhibit A-12, annual costs will gradually decrease. After the first year equipment cost will be for maintenance and replacement only. After 1330 foreign sanitary engineers will not be needed in the ostans and the foreign malariologist and entomologist will not be needed. After 1331 the demonstration spraying will have covered the country and spraying costs can drop as they are transferred to property owners. Cost of supervision will remain as a Government function. As malaria is conquered or reduced to relatively small proportions by this emergency program, the malaria budget should be combined with the general sanitation budget of which it is really a part. This budget is subject to sharp reductions from possible savings through the use of water-wettable DDT and less frequent spraying.

It is believed that this program, centered upon the DDT spraying, will in three or four years produce many malaria-free areas which can gradually be extended. The program will have to be modified in the light of experience.

Lower costs for DDT should be sought. Investigations indicate that it cannot be manufactured in Iran at present. The Majless should consider a law to remit import duties on DDT used in the public welfare.

The co-operation of other agencies, charities and foundations should be sought in the development of this project. Where such co-operation is available very rapid progress may be made.

The World Health Organization should be asked to furnish a malaria team consisting of a malariologist, an entomologist and an engineer for two years beginning work in Dey, 1328 (January, 1950).

GENERAL SANITATION

We are concerned in this project with such activities as water supply, food control, excreta and waste disposal, bathing, and housing. Activities and expenditures in sanitation will be continuing and rather evenly distributed over the country, although they will reach the more remote villages at later dates.

There are many reasons for early emphasis upon sanitation. It is basic to any public health program. Without it, infant diarrhea, ascariasis, typhoid fever, dysentery, and other intestinal infections are bound to be so common that, in many areas, practically every individual will be intermittently or continually infected.

Lack of sanitation endangers the rich as well as the poor. The distribution of infectious organisms through water, food, flies, and direct contact can be cut only by general sanitation in the community and by the practice of hygiene and sanitation in the home.

Sanitation for areas in which other Plan activities will be developed is of special importance. This means special emphasis on industrial sanitation for new industries and upon rural sanitation in connection with agricultural improvement projects.

The problems of sanitation differ somewhat in urban and rural areas. In cities, public health engineers can assist in improving and extending sanitary supervision. They can assist in planning for proper sanitation in factories which are to be built under the Plan, and can survey existing industries and recommend immediate sanitary improvements.

In rural areas sanitation will be part of a general plan of rural betterment which will also include improvements in agriculture, animal husbandry, and education. The pioneer project developed in the Veramin villages by the Near East Foundation gives a good picture of this type of approach. Demonstration areas will be selected in which health, agriculture, and education will all be improved at the same time. Rural sanitation will be extended from these areas.

The tribes, as well as villages, must have an opportunity to benefit from the program of improved sanitation, including insect control. They should be invited to send young men for training as sanitarian-vaccinators at the beginning of the training program.

National and local sanitary codes should be developed to insure a uniform standard of practice.

A review of the separate phases of general sanitation follows:

Water

The town improvement and housing section (Vol. III) recommends the installation of public water supplies in the large cities. Deep wells sunk in a few hundred villages will provide irrigation water as well as a potable water supply.

The Plan Organization cannot undertake the installation of village water supplies throughout the country, but it may need to make demonstration installations in several selected locations. Sanitarians can advise the villages and families in securing safe drinking water. The concept of safe drinking water in contrast with the water used in laundering, agriculture, and commercial purposes will be taught.

In some instances a safe shallow well can be dug at a high point at which the well is not in danger of being polluted. In other instances simple filtration equipment similar to that developed by the Near East Foundation can be provided. In still other cases safe water, emerging from the kanat, can be carried by pipes to a closed tank in the village. In some schools or industries the chlorination of water may be needed, but in general safe water will be sought. An amount of Rls. 3,000,000 a year should be allocated for demonstration wells.

Food

The present unsatisfactory sanitation of food supplies will be helped by the general sanitation program through the reduction of flies. The sanitation staff can assist both cities and villages in the development of more sanitary methods of food handling. Sanitary engineers will encourage and guide the development of food sanitation where it does not exist. Sanitation and the education of food handlers should be substituted for the present practice of merely examining the handlers.

Slaughter houses will be checked for sanitation, and the proper disposal of the bodies of condemned animals will be required, either by incineration or in some other way which will prevent the possibility of the meat being eaten.

Pasteurization of milk can be developed gradually through the supervision of two or three small supplies which are now pasteurized, and through the encouragement of pasteurization of an increased quantity of milk. Pasteurization should also be provided for milk used in making butter and ice cream. It will not be possible to require such pasteurization throughout the country, but properly pasteurized products should carry a seal of approval.

Milk used in cheese making cannot easily be pasteurized because cheese is now made in small quantities throughout the country. Facilities should be provided for the storing of hard cheese at proper temperatures for a sufficient time to allow the organisms of malta fever and bovine tuberculosis to die out. Limited funds are provided in the budget to build cheese storage facilities.

The bottling of fruit beverages should have sanitary supervision.

Provisions should be made for the manufacture of sanitary ice supplies.

Excreta and Waste Disposal

Sewerage systems are highly desirable in cities. Funds for such a purpose are not available in the health plan, although they are available in other Plan activities to some extent. If it is not financially practicable to install both potable water supplies and sewerage systems in large cities, water supplies are the more desirable from the public health standpoint.

Sanitary public latrines are needed in many cities and large villages. Their general construction cannot be an undertaking of the Plan, but the development of plans for model construction will be undertaken and in some locations demonstration units may be built.

Plans for model latrines for individual families will be developed and some latrines will be built for demonstration purposes in demonstration areas. It will be desirable also to furnish cement tops for latrines because they cannot be made by the individual farmer and are practically essential to sanitary construction. These can be produced at a cost of about Rls. 50 each. Eventually their cost should be borne by the home owner, but it may be necessary to furnish them in considerable quantity in the early days of the program.

In the plains area, deep latrines dug by the peasants have proved satisfactory. These dry well type latrines are ten meters deep and cost about Rls. 250 to excavate. The people are accustomed to them, however, whereas the proper use of dry privies would require public education. Nevertheless in the Caspian littoral or in other areas where the water table is high it may be necessary to build fly-tight, receptacle-type privies to avoid water pollution and sanitary nuisance. In some towns the best procedure would be to build septic tanks for individual families or a tank for a group of four families where the four house lots come together.

Baths

Substitution of sanitary baths for the present unsatisfactory bathing facilities described elsewhere herein is essential in combating trachoma, fungus diseases of the scalp, and other infections. Plans for model baths will be developed and some will be built for experimental and demonstration purposes. In general, municipalities and owners of the private baths will be expected and required to keep them sanitary. Existing baths can be made sanitary by keeping clean hot water in the tank and pumping it into an overhead barrel from which it will flow by gravity and mix with clean cold water from another tank to produce a shower bath of the desired temperature.

Housing

Sanitary engineers will advise concerning the sanitation of cheap houses to be built under the Plan; they will develop plans for model village houses to be built by villagers and will build a few model houses for demonstration and study. The Plan cannot build houses for everyone, but it will provide means of securing more satisfactory and less expensive building materials as well as engineering advice.

The sanitation of the premises should be improved by the elimination of the open outdoor pool found in the yard of most city houses. This will be possible when cities are supplied with a public water supply and it is no longer necessary to store ditch water in this pool in order to have water at hand for household purposes. Water in this pool breeds mosquitoes and is usually polluted, and algae sometimes produce an odor nuisance. Minnows (gambusia) are often kept in pools, in sections where the temperature of the water stays low enough to allow the fish to live, as a means of getting rid of mosquito larvae. But with a piped water supply people should be encouraged to convert the pool area to a small garden. Later the abolition of these pools may be required by law.

Municipal Sanitation

Rubbish and garbage disposal in the cities and towns is usually a municipal function and it cannot be undertaken by the Plan. Improved methods, however, will be suggested by the engineering staff.

Street sanitation needs to be improved in many towns and cities to eliminate the accumulation of human and animal wastes, and garbage and rubbish. Similar needs are seen in villages, plus the need of leveling, smoothing and grading various plots to avoid standing water.

A national sanitary code is necessary, as are local sanitation regulations. The public health engineers and sanitarians are available to aid in the development of these standards.

Persons engaged at cemeteries in washing the bodies of the dead, according to Islamic custom, are already legally under sanitary supervision. This activity should be studied by sanitary officers and recommendations made if changes are needed.

Army Sanitation

It may be possible for the Adviser in Sanitary Engineering to contribute to the improvement of military sanitation. The most helpful procedure, however, would be for a Sanitary Corps officer from the United States Army to be attached to the staff of the present Medical Adviser to the Army Medical Corps. An experienced officer of the rank of captain or major could improve Army sanitation to the eventual benefit of the civilian as well as the military personnel.

Budget for Sanitation

Costs for special sanitation personnel have been budgeted under the malaria control project. They will be aided by health education, medical, nursing, and midwife personnel, who, along with sanitarian-vaccinators, will carry on education for improving the cleanliness of homes and communities. The sanitation budget will, however, carry an annual amount of Rls. 15,000,000 to be used by way of demonstration for latrine tops, model wells, model public latrines, model family latrines, model baths, demonstration houses, and the building of cheese storage facilities. Because fixed allotments will be based on the need of each ostan, separate allocations in this annual budget of Rls. 15,000,000 are not made for the individual items.

PUBLIC HEALTH EDUCATION

The greatest potential aid in the promotion of public health is the public itself. The adult can usually avoid disease if he knows how, and does not hold the belief that diseases are the will of God and have no connection with the distribution of infectious organisms.

It is extremely difficult to make an area sanitary when people are ignorant of, and uninterested in, sanitary improvement. Furthermore, an area will not stay sanitary long without intelligent behavior on the part of the people. Public health education is also needed concerning infant care, nutrition and other health problems.

As we have indicated, this program would be under the direction of a trained public health educator. Information material will be developed co-operatively with experts in various fields and the accuracy of all material will be passed upon by the best available expert. The leadership of persons high in Government, church, and the medical profession is important. Many agencies, both Governmental and private, can and will contribute immeasurably to public health education and they should be encouraged to do so, co-ordinating their activities with the major central effort. Leadership on the local level must also be developed.

A simple set of health rules developed by leading authorities with due consideration to their educational value has been found helpful in other countries. All public health personnel will be helped to make the most of their educational opportunities. Health education councils or committees will be developed in cities and villages.

The public health education program will:

1. Develop co-operative national and local leadership in health education.
2. Secure and produce printed and visual-aid materials adapted to the psychology and interests of the people, especially in the form of films, pictures, and posters.
3. Promote a radio program. (This will be especially valuable if the Plan finds it possible to establish loudspeaker service in a considerable number of villages.)
4. Co-operate with public schools in the provision of teaching materials and in the improvement of courses of study.
5. Co-operate with the Army, as the Surgeon General has requested, in improving the health education program for recruits.
6. Co-operate with the agricultural and educational divisions of the Plan in furnishing a health educator and educational materials for educational missions.

   (It is proposed jointly by the education, agriculture, and public health sections of the Plan Organization to establish 25 educational missions in the country with sound equipment and visual-aid materials to go from village to village to stimulate interest and promote programs in these fields. These missions will go only to villages where village improvement activities are under way. This means that all 25 missions will not be organized the first year. A man well trained in village health programs will be sent with such missions as are organized.)

7. Provide for the distribution of materials. (The health education program must purchase motion-picture machines, screens, projection lanterns for slide films, and similar equipment. If a central visual education service is established, public health, along with agriculture and education, can contribute to it. If not, and to some extent in any case, health education must have its own equipment.)

Public health education will serve all sections of the country, operating most easily and most quickly in cities and reaching rural areas as rapidly as possible. It should begin at the earliest possible date and expenses will be highest during the first two years when the largest amount of material and equipment is being secured.

The chief budgetary items, summarized in Exhibit A-13, are:

1. The staff of one foreign trained health educator and one Iranian at the national level and ten Iranian educators in ostans.
2. The purchase of ten sets of health films to be re-recorded in Persian, and the possible preparation of a few documentary health films in Iran.
3. The provision of a public health representative to go with each of the educational missions.
4. The printing of suitable educational pamphlets and source material to be used in schools.
5. Projection equipment.
6. Travel.

Health education costs will decline after about two years, and budgetary allocations for subsequent years should be remade at that time.

PUBLIC HEALTH LABORATORIES

The Seven Year Plan undertakes the establishment of an adequate laboratory service, to be initiated in the second year of the Plan. Water analysis laboratories will be established with the installation of public water supplies in some 14 or more cities. These laboratories will make the control analyses for water supplies, but can also analyze other water samples. Regional laboratories are not expected to undertake tests for food adulteration at present, but adequate diagnostic services should be established regionally as soon as possible. The year 1329 should be used in securing adequate laboratory equipment and in training personnel, which should include a director of laboratories at the national level, directors of local laboratories, and laboratory technicians.

The director of the laboratories to be developed and improved under the Plan should be given a foreign interneship for a period of six months to a year. The present medical directors of local laboratories can be helped to standardize their work by short intensive study in Tehran and by visits from the laboratory director. High school graduates will be brought to Tehran for a year of training, under suitable auspices arranged with the medical school, hospital laboratories, or health department laboratories, to become laboratory technicians. These technicians will be taught merely the technique of standard laboratory procedures. Fifteen girls or boys should embark upon such a program of study during the first months of 1329. It may be desirable to train a second group of 15 during the third or fourth year of the Plan, and perhaps to increase the number of regional laboratories from ten to twenty.

The proposed budget allocation is shown in Exhibit A-14.

TUBERCULOSIS, VENEREAL DISEASE AND TRACHOMA CONTROL

These widely different diseases have in common, perhaps, only the fact that they are major nation-wide health problems, each with its own peculiar control methods which lie outside either sanitation or immunization.

Tuberculosis

The seriousness and extent of this disease makes it one of the most important of the public health problems. Diseases like malaria and smallpox have a higher priority in program planning because we have effective weapons against them and can save more lives quickly in first attacking those diseases. The Seven Year Plan, however, should at least lay the foundation for a more vigorous program in tuberculosis control.

Since we do not know the incidence of tuberculosis, it would seem natural to make an extensive case-finding survey of typical groups, both urban and rural, in various parts of the country, especially in the Caspian area where the rate is highest. For practical considerations, however, we would suggest that this exploration may best be carried on by the establishment of diagnostic clinics in a few selected urban communities.

There are several reasons for this suggestion. Portable X-ray equipment (with generator attached) costs about Rls. 800,000. It is bulky to handle and difficult and expensive to operate. Tubes cost about Rls. 20,000 each. Rolls of 70 mm film containing 100 frames cost Rls. 400 each. 35 cm x 43 cm retake films cost Rls. 20 each. In the United States the cost of X-raying with small film varies widely, but is on the average about Rls. 24 per person.

The technical difficulties are even more serious than the high costs. Small films are difficult to read and, unless larger films may be used for confirmation and the patient may be brought back for further study, accurate interpretation is often impossible. It is likely that most adults would show positive X-ray findings.

Diagnostic clinics, with skin testing, followed by X-ray for the positive cases and clinical examination where needed, have many advantages. They can use the less expensive and more satisfactory type of X-ray machine costing in the neighborhood of Rls. 320,000 to Rls. 385,000 and can be located in cities having electric current and where extensive medical service is available.

It is proposed to begin expenditures for tuberculosis control during the second year of the Plan. During the first year the availability of expert personnel and equipment will be determined. The World Health Organization sends out teams of experts in tuberculosis control and it is hoped that such a team may be secured for Iran. A formal request for such assistance should be made by the Government at the beginning of the Seven Year Plan. If such a team is available further plans for co-operation should be worked out with WHO. If it is not available, plans for exploratory diagnostic clinics should be set up, using Iranian experts as far as available, but foreign experts if needed.

The widespread use of BCG vaccine is, of course, a possibility, but we do not have enough information upon its effectiveness as yet to recommend it as a national program. Within the next few years sufficiently conclusive evidence may appear; if so, the Plan should undertake widespread vaccination of children.

Since there are less than 1,000 beds now available for tubercular patients, sanitoria are seriously needed. Present facilities can be expanded somewhat, but in-patient care is expensive and the construction of sufficient sanitoria is obviously impossible.

It should be remembered that economic, dietary and hygienic improvement in an area tends to lower the tuberculosis rate. Health education in the avoidance of infection is a valuable and inexpensive activity. We may expect some benefits from these sources.

In the face of this situation it is proposed, as indicated above, that the first year be used to explore the possibilities of case-finding clinics and of securing a WHO team of experts. In the second year we propose the establishment of case-finding clinics, to operate during the third and fourth years on an annual budget of Rls. 3,250,000. This budget is then expanded to intensify the fight against tuberculosis through clinic services, vaccination, or sanitorium care. The health budget shown in Exhibit A-15 is subject to reorganization in the second or third year.

> Note: The attack on tuberculosis in the Philippine Islands, reported in Public Health Reports, Vol. 64, No. 5, under date of Feb. 4, 1949, presents an experience which may be helpful in Iran.

Syphilis

A survey to determine the incidence of syphilis is the first logical step in a more vigorous attack upon venereal diseases. Health officers have estimated the incidence of syphilis for different city and village areas all the way from 20 to 90 per cent.

A public health campaign to reduce venereal diseases must supersede the present program, which is limited to treatment of such persons as come to hospitals and polyclinics. Detection and treatment of syphilis in expectant mothers should be extended as rapidly as possible in order to reduce the large amount of congenital syphilis.

The present legislation gives legal support to an active venereal disease campaign, but ostan health officers have not had facilities to put a program into operation. These health officers have asked the Ministry of Health for drugs with which to begin such a program. It seems logical for the Seven Year Plan to undertake a study of the distribution of the disease, to develop model venereal disease programs in at least a few localities, to extend such programs as widely as circumstances permit, to carry on an educational campaign, and to supply drugs for rapid treatment in situations where it will markedly contribute to the public health. Universal prenatal and premarital blood testing is desirable, but cannot now be undertaken.

Typical groups to be studied in determining prevalence might well include Government employees, workers in key industries, population groups in areas where the incidence is believed to be highest, and typical village groups in different parts of the country. Serological tests are now available which fairly well separate syphilis from other conditions with which it has often been confused. These tests can be carried out by an expert team with portable equipment, or samples may be taken and the serum (minus the red cells) transported to a central laboratory.

The World Health Organization has expert teams in venereal disease control and should be formally requested by the Government at the beginning of the Seven Year Plan to send such a team to Iran. If it can do so plans will be made with it during the first year of the Plan, and the team might be in Iran during the second and third years. If help cannot be secured from that source, plans must be made during the first year to see what can be done within the country.

One immediate step which can be carried out, and in which the help of the Plan may not be necessary, is to examine all soldiers before they are discharged from the service to return to their own communities and to hold infected men under treatment until cured.

The budget for syphilis control shown in Exhibit A-15 provides for no appropriation during 1328, when plans for a case-finding survey will be made. During the second and third years, appropriation of Rls. 3,250,000 for case-finding studies and experimentation with local programs is contemplated. During the remaining four years the appropriation is increased for the expansion of venereal disease work along the lines indicated above. It may be found that appreciably more money is available for this purpose.

Trachoma

The procedure in fighting trachoma will depend upon the effectiveness of sulfanilamide as a specific agent. Experimentation with it should be undertaken as soon as possible. If it proves effective, as it has in the United States, trachoma control should be extended to all areas where health centers are available, if not to the nation as a whole.

We discussed the problem of controlling trachoma and the experience of the Bureau of Indian Affairs with Dr. DeLien, the Assistant Medical Director of that organization. Treatment up to 1939 by the method of producing scar tissue was relatively ineffective in reducing the amount of trachoma. Sulfanilamide treatment began at that time and the incidence of the disease has dropped very sharply. Sulfathiazole and other sulfa drugs have been tried and found relatively ineffective. Aureomycin has been recently tried, but results were not conclusive. Sulfanilamide is the approved remedy on the basis of information at hand. Treatment has been by mouth with .2 to .5 grains per pound of body weight daily in divided doses, continued for 20 days. It has been found that over 90 per cent of the cases were cured with one course of treatment when a dosage of .5 grains per pound of body weight was administered daily for 20 days. Local treatment, however, was not effective with either sulfanilamide or other drugs tried. At first patients were put in hospitals, but later were given the pills to take at home. All of the infected members of a family were treated at the same time to reduce the danger of reinfection. They were told to watch for certain symptoms and report back to the physician if the symptoms appeared. The physicians of the Indian service have found that Indians seem to tolerate sulfanilamide much better than do Caucasians.

The present situation suggests that a survey of trachoma incidence would not be worth while, due to the difficulty of differential diagnosis and due to a belief of American ophthalmologists that conjunctivital infections which do not respond to sulfanilamide are not trachoma. It would seem better to have a carefully controlled experiment in sulfanilamide treatment, which, if successful, should be expanded into a program as extensive as available personnel and funds permit.

The allocation of funds in the Seven Year Plan for the control of trachoma is shown in Exhibit A-15.

VACCINATION

The present vaccination program is unsatisfactory, and it is agreeable to the Ministry of Health that the Plan Organization should undertake an effective program and put it in good running order. Vaccinating is substantially a seasonal function and the present vaccinators are used as hospital orderlies through a large part of the year. We therefore propose to develop sanitarian-vaccinators in order to put this activity into the hands of full-time public health workers. It is assumed that these health services will be spread throughout the country and physicians, nurses and midwives will increasingly undertake this function.

Immediate widespread vaccination against smallpox and typhoid fever will cut those diseases sharply and will be an effective example of the benefits of prophylaxis.

Immunization against diphtheria, whooping cough and tetanus cannot be extended immediately; but it should be provided at infant welfare stations as health centers are developed, and should be extended to the school population where school health personnel is available. Smallpox vaccination and probably typhoid vaccination, on the other hand, can be carried to all parts of the country, including tribal groups and remote villages.

It is proposed to employ 200 of the most capable men in the present group of vaccinators for immediate service, while others are beginning training in sanitation or continuing as hospital orderlies. For the last half of 1328 the recommended allocation for this project is as follows:

Salaries (200 vaccinators at Rls. 3,000 a month for 6 months)	Rls. 3,600,000
Bicycles and transportation equipment	400,000
Refrigerators, shipping containers, syringes, etc.	600,000
Vaccines for 1,500,000 persons	7,250,000
Total	Rls. 11,850,000

In subsequent years the two equipment items of the budget would be reduced to Rls. 600,000 annually for maintenance. In 1329 the allocation for vaccination is Rls. 22,300,000 and for the remaining years of the Plan Rls. 122,350,000, making a total for the seven year period of Rls. 156,500,000.

MATERNAL AND CHILD HEALTH

Two major causes of death are the completely unskilled midwifery by means of which most of the babies are delivered, and failure on the part of mothers to safeguard the young infants from infection. Reduction of maternal deaths from hemorrhage, septicemia and tetanus, and reduction of infant deaths from infant diarrhea and other infectious diseases must be sought at once. If the level of midwifery care can be raised sufficiently to reduce maternal infections and give the mother some guidance in the early care of the infant, a great gain will be made.

Eventually we look forward to western standards of obstetrical and infant care with prenatal clinics, postnatal care and well baby clinics. This type of service can be begun in cities and in health centers and gradually expanded; however, the development of this program must necessarily be slow. The more important problem is to raise the level of midwifery service at least to the point where maternal and infant infection can be sharply reduced.

There are certain difficulties in improving midwifery in remote villages. The occupation there is not remunerative; city girls who are graduates in midwifery do not want to live in the villages; village girls who come to the city for two or three years of study are unwilling to go back to the villages; older midwives are not eager to learn better methods. However, midwifery is commonly passed on from mother to daughter, and the daughters of midwives are more receptive to training.

The obvious way to improve midwifery service is to have the present midwives instructed by graduate midwives, both in the art of midwifery and in the advice which should be given to the mother regarding prenatal hygiene and the care of the young infant. The instruction will naturally be somewhat limited, but the graduate midwife must obviously be trained in how to teach untrained midwives.

Both Java and South America have made appreciable progress in reducing maternal and infant deaths through such a program. With graduate midwives specially trained for this work, small groups of midwives can be brought together for instruction. In the sparsely settled rural areas where there may be only one midwife in a village such instruction is difficult. In such cases it may be necessary to bring 25 village midwives (preferably young married women) to a central village for a one-month or two-month intensive program of instruction. Rural health centers, as they are established, will provide opportunities for the extension of better midwifery service. Tribal leaders say that the girls from the tribes will be allowed to go outside to study midwifery under suitable supervision. At present it may be necessary to establish short-term schooling for the tribal midwives in one of the tribal villages.

Two procedures should be experimented with, (1) using graduate midwives (who have been trained in public health perspective) to work in communities, teach the midwives better methods, deliver some of the more difficult cases, and instruct the mothers, and (2) bringing together classes of 25 midwives from remote villages for intensive training under such a person.

There are now about 300 trained midwives in the country and the present schools will graduate about 100 a year. It is from this group that we must employ and train midwives for the type of work described above, using some 50 suitable young women during the first year of the Plan. They will need training and experience under professional leadership before they are ready to undertake the public health aspects of their work satisfactorily. There will be some advantage in beginning this program with a limited number so that careful instruction and experimentation will be possible.

Twenty-five could work in the large communities; the other 25 of this group might spend four months in indoctrination and, in the next eight months, hold four one-month (or six-week) classes of 25 midwives each, from remote villages. The village midwives who are brought together in a larger village will need a subsidy of about Rls. 1,000 per month. In eight months, the 25 graduate midwives would teach 2,500 untrained midwives from remote and inaccessible villages.

The time between these one-month (or six-week) classes would be used in organizing the next group. A proportionate number of these classes would be held in tribal villages for tribal midwives. The budget for beginning this type of program would be:

	Thousands of Rials	
	Last Half of 1328	1329
Salary for 50 graduate midwives at Rls. 4,000 per month	1,200	2,400
Subsidy for 2,500 midwives	1,250	2,500
Transportation and facilities for training	175	350
Total	2,625	5,250

Another problem in this field is that of securing properly-trained midwives for employment in health centers and health departments to carry forward the work of further improving midwifery service in the future; this will be considered under personnel training.

The cost of employing midwives will mainly go into the budget for health centers, except for perhaps 100 midwives who will be employed outside these centers at a cost of Rls. 5,000,000 per year, starting in 1329.

Demonstration centers for modern, complete maternal and child health programs are desirable; however, they are expensive and do not represent a type of program which can be extended throughout the country at present. The Plan can establish a few of these demonstration centers in cities, and it is hoped that others may be developed under private auspices. After the third year the Plan may be in a position to increase the number of such centers.

A survey of child care institutions, and a study of present and needed legislation in this field, are desirable.

The total budget for maternal and child health is as follows:

	Thousands of Rials
Last half of 1328	2,625
1329	10,250
Remaining years of Plan	87,125
Total	100,000

INDUSTRIAL HYGIENE

Here the Plan is primarily concerned with producing more healthful working conditions. Engineers will advise in the sanitation of new industries to be built. They will make sanitary surveys of present industries with respect to such items as: dust, industrial poisons, lighting, working position, length of the working periods, and rest pauses.

Industrial hygiene experience shows that improvements, such as the engineers would recommend, will increase output and lower production costs. Rest pauses and better lighting, for example, have been shown to decrease spoilage and increase the production rate.

Services of the sanitary engineers are provided for in the budget for malaria control.

An additional annual budget of Rls. 500,000 is provided in the second year of the Plan, with provision for small increases in later years for industrial health studies in the factories of all ostans.

The budget for industrial hygiene is as follows:

	Thousands of Rials
1329	500
Remaining years of Plan	3,000
Total	3,500

SCHOOL HYGIENE

The schools have an item in their budget for sanitation and a few of the cities provide school doctors. The Plan can be of assistance to schools in:

1. Making sanitary surveys of schools with recommendations to the Ministry of Education.
2. Assisting schools in health education through preparation of materials and in revision of the curriculum.
3. Providing school medical service for village schools where health centers are established.

These activities would not require a separate budget. The health education budget will provide materials for health education in schools and workshops in which teachers of health in normal schools may work with public health experts in improving their programs. A mental testing program in the schools, and a teacher training program, are included in the recommendations in the education section of this report.

IMPROVING QUARANTINE FACILITIES

It is essential to have adequate and dignified, though not expensive, quarantine facilities for the examination for persons entering or leaving the country, and for the retention of infected individuals. The need of each quarantine station must be studied before specific recommendations and costs can be estimated, especially since the amount of traffic entering the different stations is changing sharply. For example, very few people now enter at Pahlevi. The relative importance of ports on the Persian Gulf may also change as port facilities are improved and tributary areas developed. The principal airports of Tehran and Abadan now handle considerable passenger traffic.

No activity is recommended in this field during the first year because of the pressure of more urgent matters, and because it will be easier to estimate the changes in travel habits after that time. The survey of quarantine needs can begin during the second year and construction may be undertaken as the need for facilities is determined. The tentative budget, subject to the findings of the survey, is as follows:

	Thousands of Rials
1329	7,000
Remaining years of Plan	35,000
Total	42,000

NATIONAL INSTITUTE OF HEALTH

An actively operating National Institute of Health in Tehran is needed to provide:

1. A laboratory for the standardization of public health laboratory procedures and the testing of foods and drugs.
2. A research center for the investigation of public health problems.
3. Facilities for training medical, laboratory and other personnel for public health work.

This institution should be combined with the present activities of the Pasteur Institute, which now has considerable space, some good buildings, and additional buildings under construction. It is probable, however, that a new building would be needed for this purpose which might cost from Rls. 30,000,000 to 35,000,000, with another Rls. 10,000,000 needed for equipment.

A careful study should be made to see whether suitable facilities are presently available so as to avoid construction.

The training functions of the National Institute of Health should have a proper relationship to the University of Tehran. The latter is a well-organized Government institution which provides certain acadamic needs. The Institute of Health will not give professional degrees for pre-service training. It will give only brief in-service training to new or old appointees to the Government service for which certificates but not degrees may be awarded. Even in these activities it should draw upon the University as well as upon the Ministry of Health for instructional personnel.

It will operate a food and drug testing laboratory, and a research center. Laboratory, statistical and administrative health problems peculiar to Iran should receive its attention. It may or may not be found desirable to house the routine public health testing laboratory for the Tehran area in this building. The staff would be supplemental to, and combined with, the staff of the Pasteur Institute, which has its own budget and is already carrying on research in immunology. For work on particular problems it may bring in field personnel or purchase professional services from experts at the University, or elsewhere.

The following proposed budget allows for a building, if that is necessary, during the third year:

	Thousands of Rials
Last half of 1328	2,500
1329	2,500
Remaining years of Plan	70,000
Total	75,000

REDUCTION OF DRUG ADDICTION

Opium production is a severe drain upon the economy and the vitality of the country. The farmers who raise opium get only a small part of the retail sales value of the crop. The Iran Government and the medical profession have taken a firm position at international conferences in advocating the abolition of poppy growing. The growing of poppies for medicinal use is unnecessary. The world's present supply of opium would last several years and synthetic drugs are increasingly replacing compounds made from opium.

The Seven Year Plan proposes abolition of poppy growing, and substitute agricultural crops are recommended. It will not be possible to eliminate completely the growing of poppies, but a vigorous attempt to do so is in the best interest of the public health. The Plan Organization can assist in the battle against opium smoking by furnishing drugs to be used in curing the opium habit and by public health education. Health education against alcoholism is also needed.

An annual budget of Rls. 1,000,000 is allocated for special activities and studies in the field of drug addiction.

MENTAL HYGIENE

No specific budget for the promotion of mental health is recommended for the Seven Year Plan, although the existence of the mental health problem is recognized. It is felt that other items have a higher priority than a mental hygiene program. Preventive activities will be found in the program of mental testing of school children recommended by the education section and in the proposal for a survey of recreation. General contributions to mental health will be made by improvements in the standards of living and by the continuing improvement in the education and social position of women. The need is recognized for more extensive and improved clinical services and care for the insane, but that is a treatment problem.

DENTAL HYGIENE

Dental hygiene activities under the Plan will be restricted to public education in dietary improvement and oral cleanliness. The promotion by religious doctrine of the regular cleaning of teeth with an individual root or brush will be helpful. Dietary advice for expectant mothers is especially important.

Accurate information concerning the amount of dental caries, malocclusion and gingivitis is needed; such information regarding children should be gathered by school dental surveys. The Plan should allocate Rls. 400,000 for a dental survey in the schools of one city in each of the ostans, and about Rls. 100,000 each year for special projects in dental health education.

It may be that some publicly applicable caries prevention measure may become available before the end of the Seven Year Plan. For example, further research upon the use of fluorine or individual amino acids may confirm the practicability of their use. Should this be the case a reallocation of funds would be made to provide an extensive program of caries prevention.

The budget for dental hygiene is as follows:

	Thousands of Rials
Last half of 1328	100
1329	200
Remaining years of Plan	5,200
Total	5,500

VITAL STATISTICS

Plans will be made to secure as much useful public health information as possible in the proposed national census. For full particulars regarding this census and other information on vital statistics, see the section on statistical organization in Volume V. The adoption of the revised standard International List for recording diseases and deaths should be undertaken. Private agencies should be encouraged to accumulate accurate health data in various localities through disease surveys. "Statistical areas" in which adequate birth and death reports may be secured, such as Tehran and Shiraz, should be established as soon as possible. In cities and towns with health departments, communicable disease reporting should be made easy for physicians, and the co-operation of the medical profession must be secured in the interest of prompt and adequate reports.

Specific contributions of the Seven Year Plan will include foreign training for one or more biostatisticians (unless such a person is trained through some other fellowship) and in-service training of health officers and statistical clerks. These costs are included in the personnel training budget.

An annual amount of Rls. 500,000 is allocated for statistical services, records, and materials in connection with translating the revised International List of Causes of Death into the Persian language, and for special statistical projects and studies.

NUTRITION SURVEY

A nutrition survey which will produce badly needed data concerning the present diet of typical groups, and the kinds and frequency of nutritional diseases, should be undertaken as soon as practicable.

The study of nutritional deficiency diseases must be under the auspices of clinical experts equipped with apparatus for making the modern tests for the respective deficiencies. It will be carried out in various parts of the country so that it will reflect the distribution of these diseases in the major typical groups of the population. The data will require careful statistical analysis and organization.

The study on food habits should be carried out by nutritionists. It will require not only the careful collection of data but also statistical analysis and evaluation.

We recommend that these studies should be made in the third and fourth years of the Plan. If they were undertaken at present it would be necessary to have them carried out by foreign experts. Three or four years from now, foreign-trained Iranian experts in these two fields may be available. In any case the family interviews on diets will have to be made by someone fairly familiar with the language. Rls. 6,000,000 are allocated for these studies.

Inquiries should be made of the World Health Organization to see whether it is possible to secure teams of experts to carry out these two studies.

SURVEY OF RECREATION, PHYSICAL EDUCATION AND SPORTS

The physical health, the mental health and the richness of life of a nation are widely influenced by recreational opportunities and customs. This applies particularly to recreation in the field of physical activities. The physical education program in the schools should lead to the enjoyment of body-building activities, to the development of skills in physical activities which can be continued in later life, and to the development of the highest qualities of sportsmanship. The promotion of the right kind of physical education and sports for youth, and recreation for both youth and adults will make a significant contribution to the national health.

A survey of these problems by international experts who can bring to this country the best experience of other nations is highly desirable. It should be done with the broadest co-operation of health authorities, educational authorities, private agencies, and national leaders.

Such a survey is proposed in the fourth year of the Plan. It will require a year of time for two foreign experts, one in physical education and one in recreation, each working with an Iranian counterpart, and the services of two bilingual secretaries.

The budget provides for an allocation of Rls. 1,352,000 for this project in the fourth year of the Plan. Of that amount approximately Rls. 741,000 in foreign exchange will be required.

PUBLIC HEALTH IN RURAL AREAS

This is a highly desirable health activity for Iran, since the rural population of some 11,000,000 or 12,000,000 persons now has no public health service whatsoever.

The discussion of this important project has been deferred until now in order that the consideration of specific needs might show the breadth of service which rural health departments with health centers can render. Although their desirability is universally recognized, certain precepts must be kept in mind in planning the rate at which they can be developed:

1. Rural health centers must not be developed in such a way that they become mere treatment centers like the present polyclinics.
2. Personnel with public health training must be developed to man these rural health departments and public health centers. It would be undesirable to complete the building of these centers before they can be adequately staffed. Buildings will be necessary to house health centers and in many cases to house personnel, but these buildings should be erected only when and where they can be immediately used. There are at present many hospital and clinic buildings in the country which are being only slightly or inadequately used. The people believe the Government is prone to erect buildings and provide jobs, but not to get results.
3. The situation demands, and the Government has decided, that the Seven Year Plan should develop a health program which, particularly in its initial stages, makes the most direct attack possible on specific diseases.
4. It is desirable that the people of rural areas should come to want and demand public health service, in order that they will utilize them.
5. The development of agricultural demonstration areas in the Seven Year Plan will demand health services to help insure their success. Village improvement programs, involving agricultural, educational and health improvement, will be established in many sections of the country. These programs need health services at the earliest possible moment. In these areas we shall have ideal centers for training various types of personnel for rural work. From these areas rural health service should spread in strategic directions.
6. The leadership and quality of service in these rural health centers must be so high that public demand will insure the necessary increases in budget allocations from local and national sources to continue, develop, and extend rural health service after the end of the Seven Year Plan.

These considerations show that the major expansion of this program must come in the later years of the Plan. During the first year or two, centers must be established in the agricultural demonstration areas with the limited number of trained personnel which can be made available, and additional personnel must be trained. The experience gained from these first units will be valuable in the development of methods of work, in indicating the area and population group which can best be served by such a rural health department, and in providing a center for observation and for the training of workers for future rural health centers.

Other units will be established as rapidly as personnel and budget permit. They will be located on the basis of the need, readiness of the people, available highways, and economic factors. Although they will be distributed fairly evenly among the ostans in terms of population they cannot be established in arbitrarily predetermined spots.

The personnel of each unit will be: (1) medical director (behdars will be used in the first units although it may later be possible to use diplomate physicians in larger centers), (2) midwife, (3) male nurse (pezeshk-yar), (4) sanitarian-vaccinator, (5) clerk,

(6) cook, (7) gardener, and (8) janitor. These units will be under the supervision of the ostan representatives of the Seven Year Plan.

The duties of the staff will be entirely in the field of public health. All will be under contract to maintain full-time status. Clinics for communicable diseases will be operated but not polyclinics for the treatment of all diseases. The clinics for different diseases will be held at different times on a fixed schedule, and patients with tuberculosis, venereal disease, or trachoma will come to the proper clinics from the various villages of the area.

The physician and midwife will not have private practices. They will both have had some public health training in addition to the undergraduate curriculum which has been followed in the past. The need for curative medicine in these areas is recognized, but if we should extend the program of the present Ministry of Health clinics, each health center would be flooded with medical cases to the point where it would work almost entirely in the village where it is located and would not be able to do prophylaxis even there.

The staff will be concerned with sanitation, health education immunization, the hygiene of mothers and children, and school hygiene.

The following salary scale was suggested in the plans made earlier by the Advisory Committee on Health to the Seven Year Plan. (The position of clerk was added by us.)

Behdar	Rls.	4,325
Midwife		2,900
Pezeshk-yar		2,540
Sanitarian-vaccinators		3,000
Clerk		1,500
Cook		1,200
Gardener		1,152
Janitor		1,152
Total	Rls.	17,769

These salaries are generally in line with present Ministry of Health salaries, which are inadequate, as we have pointed out in the discussion of the salary problem. If we use a salary scale like that of the Imperial Social Service Organization the salaries of technical workers in these remote villages would be just about doubled.

For our present purposes let us nearly double those figures and estimate salaries at Rls. 34,000 per month. If we add to that the estimated operating costs of the Plan Organization and a suitable figure for property maintenance and depreciation, and for the purchase and operation of transportation equipment (mainly motorcycles and bicycles), we would have the following approximation of annual costs:

Salaries	Rls.	408,000
Operating costs		67,000
Property maintenance and depreciation		15,000
Transportation and equipment costs		10,000
Total	Rls.	500,000

The Advisory Committee to the Planning Board believes that living quarters for the staffs would have to be built in most of the remote villages in order to provide the type of habitation which would make technical personnel willing to accept employment in these rural units. An investigation will have to be made in each instance to see whether buildings will be necessary, as it is the policy of the Plan to avoid their erection, if possible. It is best to assume, however, in estimating costs, that the sort of building suggested to provide office space, clinic space, and living quarters will be necessary. The type of building in its design would receive the consideration of the engineering staff, but for the present we may assume the type of building suggested in the careful estimate of the Planning Board's Advisory Committee, and accept the figure for construction costs of Rls. 500,000 each.

For present planning, and until experience gives us a more exact estimate, we shall therefore assume a construction cost of Rls. 500,000 per unit and an operating cost of Rls. 500,000 per unit per year. It is hoped that savings in malaria control costs and in other activities will make it possible to expand the following budget appreciably.

Budget for Health Centers

	Thousands of Rials		
	Domestic	Foreign Exchange	Total
Last half of 1328	9,900	100	10,000
1329	39,500	500	40,000
Remaining years of plan	252,500	2,500	255,000
Total	301,900	3,100	305,000

TRAINING OF PERSONNEL

The Plan is free to train public health personnel but not personnel for the treatment of diseases. The need for further training of personnel (physicians, bedside nurses, midwives, and pharmacists) has, however, been recognized.

Certain personnel needs have been indicated in discussing various projects, and some training costs have been indicated. Let us consider the specific training needs.

Foreign Training for Public Health Specialists

There is a vital need for well-trained men in public health administration, public health engineering, public health laboratory methods, biostatistics, communicable disease control (including special fields such as malaria, trachoma, tuberculosis and venereal disease control), health education and school hygiene. At least 50 Iranians should be given such training abroad during the Seven Year Plan. They should be chosen by the Plan Organization and given a contract under which they will serve either the Plan or some other branch of the Iranian Government for at least three years after their return.

The period abroad should be from 18 to 24 months. It would be desirable, though not necessary, to study in America or in England. If they have a year and a half or two years abroad they can master the language in time to complete the course of study for the master of public health degree. The best men should be chosen on the basis of their academic record or by examination. This selection would not be possible if the program of study is only one year and only those men are selected who have a command of the foreign language in which they will study.

The first group could not return to Iran before the spring of 1951. The urgent need for personnel suggests that a large number should be sent during the first year instead of sending the same number each year. However, it is doubtful that more than 20 suitable candidates can be sent the first year. At least 10 should be sent during each year. The geographical distribution of applicants should be considered in their selection. American funds under the Fullbright Act may be available for paying round-trip passage for those who study in the United States.

The cost per student would be in the neighborhood of Rls. 100,000 per year. The suggested budget allocation is shown in Exhibit A-16.

A year ago the Rockefeller Foundation offered to Iran a fellowship in biostatistics, one in public health engineering, and one in epidemiology. It was left in the hands of the Technical Adviser to the Ministry of Health to secure candidates for these fellowships. The Seven Year Plan will adjust its program of fellowships for foreign study to make use of fellowships offered by the Rockefeller Foundation, the World Health Organization, and other agencies.

Behdars or Rural Health Officers

The behdars who are to man the first rural health units will need intensive public health training for three to six months in preparation for their work. They have been trained only in clinical medicine, and those who have been already at work have worked only in this field. Without public health training and reorientation their failure in directing health centers is certain.

The Plan should seek the best possible candidates for the limited number of health centers to open the first year, and give them intensive training during the period the buildings for the health center are being prepared and equipped. They do not need a subsidy because they will already be on an employment basis, but there will be the cost of instruction. The instruction should be set up with the approval of the health director of the Seven Year Plan, either at the University or as a separate program under a national health institute type of organization. It may be that the University will be able to undertake this project.

A sum of Rls. 130,000 is provided to cover instructional costs and facilities for a six months course. This item is carried in the budget for every year because behdars employed later during the expansion of the program will need similar training unless the present curriculum can be modified. It is doubtful if satisfactory curricular modification can take place because behdars are trained in several schools, and facilities for public health instruction are limited outside of Tehran.

This intensive program of study should have a carefully planned curriculum and should include instruction in rural health administration, rural sanitation, the recording of vital statistics, health education, the rural program for maternal and child health, the operation of communicable disease clinics and the technique of simple laboratory tests. Field visits should be planned to inspect the rural program of the Near East Foundation and to any other good rural health programs which may be developed.

There remains the problem of securing behdars for future appointments. Something over 100 behdars a year are now being graduated from existing schools. The Plan can borrow some of the men from the Ministry of Health. If it is possible to develop as many as 150 to 300 health centers, however, the present supply of new behdar graduates will probably not be sufficient.

The behdars now in school are being trained for Ministry of Health work and we are told by the Technical Adviser to the Ministry of Health that they are under subsidy. It would seem desirable and necessary, therefore, to subsidize the training of 300 to 500 behdars to graduate at the rate of 50 to 100 a year as soon as this figure can be reached. Some of those already in training would doubtless be willing to accept the type of contract the Plan would offer, under which their training would be subsidized and they would agree to serve the Plan for some other branch of the Government for five years at a suitable salary. We recommend subsidies in amounts necessary to attract the above number of behdars.

A study of each school will be needed to determine whether additional facilities in plant or instruction are needed by the schools for behdars in order to accommodate this additional group. The sum of Rls. 24,000,000 is allocated for supplementing plant facilities and for instruction. Recommended allocation, by years, for the training of behdars is shown in Exhibit A-16.

Books

At present the University Medical School and the schools training health workers are lacking in adequate library facilities in the public health field. Such library resources are essential for adequate instruction. The budget therefore carries an item for public health books of Rls. 200,000 the first year and Rls. 30,000 during the second, third, fourth, fifth and sixth years, to supply needed teaching materials to the medical school and other schools training health workers.

Midwives

There are only 300 graduate midwives, of whom 135 are employed by the Ministry of Health. Something over 100 a year are now being graduated. We have two training problems here: public health instruction to midwives who are to be employed by the Plan, and the guaranteeing of a sufficient number of trained midwives for future employment.

We have said that the first group of midwives to be employed needs an orientation course. This course will need to be arranged at the University or at Tehran somewhat like the course for behdars; the first course will be given at the beginning of the Plan for the first 50 midwives employed and will be repeated annually. A budget for instruction of midwives over a three months interval is set at Rls. 50,000 a year for each of the first six years.

In order to secure sufficient midwives it is proposed to subsidize the training of 500 midwives over the next five years. We recommend subsidies in amounts necessary to attract that number.

The sum of Rls. 10,500,000 is allocated over the seven year period for equipment and instruction costs which the schools may not be able to meet. Total budget allocation for the training of midwives is shown in Exhibit A-16.

Male Nurses for Health Centers

There are about 500 male nurses in the country and about 50 graduating each year. No public health nurses are available for employment. The problem of getting nurses who can assist in the public health program for health departments, through aiding at clinics and home visiting and health education, is similar to the problem of securing midwives for public health work. In most cases these nurses would be men. The budget allocation for public health training, for subsidizing basic training, and for equipment and instruction is identical to that for midwives.

Laboratory Personnel

Training plans and funds for laboratory personnel were set up in the public health laboratory project.

Sanitarian-vaccinators

The program for training boys for malaria control and village sanitation, under the direction of the Plan, has already been discussed. An arrangement should be made with the Near East Foundation to begin the training of the first group of 40 boys, four from each ostan, at the earliest possible moment. This is the only "laboratory" now existing in Iran in which these boys can participate in a village improvement program such as that contemplated by the Seven Year Plan, and in which there are experienced Iranian instructors. These boys will be used in the rural demonstration areas to be immediately established and the best of them may be used in the instruction of additional groups, if and when training centers are set up in the other ostans.

At least 600 such workers should be trained for use in health centers. This type of boy could also work, with a moderate amount of supervision, in village areas where public health programs have not been established. He will be given a perspective of the agricultural program and the new village school program and will co-operate with agricultural extension agents and teachers. He will be trained to vaccinate, although this program will later be taken over by medical and nursing personnel.

The sanitarian-vaccinator will be specially trained, during his four to six months' period of study, in malaria control and in improving the various aspects of general sanitation (water, food, housing, streets, excreta disposal, etc.) in the villages. He will be given training and practice in working with villagers, and in selling to them this program of better sanitation.

To a considerable degree vaccinators who are already employed will be used, and in other cases selected boys will be employed for the brief period of the school training. Subsidies are therefore not needed. There will be, however, some costs for housing these students, for providing classroom facilities, and for instruction, both in the first and continuing courses at the Veramin villages and in other training centers which will be set up later in other ostans. For this purpose a budget is set up as shown in Exhibit A-16.

Administrative Costs

The overall administration of the public health program will require an Iranian administrator at the national level, with an experienced foreign adviser for a period of five years; an Iranian administrator in each ostan with a foreign adviser for three years; and the necessary secretarial services, travel, and other operating expenses. The following amounts are allocated for administrative costs.

	Thousands of Rials		
	Domestic	Foreign Exchange	Total
Last of of 1328	1,433	2,259	3,692
1329	2,866	3,088	5,954
Remaining years of Plan	15,763	6,323	22,086
Total	20,062	11,670	31,732

TOTAL BUDGET

It is recognized that budget allocations can only be tentative. Some budget items are uncertain until the detailed plans of operation are made, for example: is a building necessary for the National Health Institute? Will some buildings be necessary for housing students? To what extent will training subsidies be needed? To what extent will houses have to be constructed for rural health personnel? What will be the soundest salary scale?

The items in the budget for the first two years are quite definite although the estimated amounts may be inexact. For the later years the items themselves may be changed. It is assumed that extensive budgetary revision will have to be made at the end of two years on the basis of experience and changing needs.

The costs of malaria control may change sharply. Experimentation with sulfanilamide will determine the extent to which trachoma control should be undertaken. Constructive public health programs for maternal and child health, and tuberculosis and venereal disease control could be expanded to the point of using a very large share of the total budget. Decisions will have to be made between the extension of these special services and the extension of basic public health services to rural areas. A complete modern rural health program would use the total budget.

We cannot now predict whether certain health activities of the Plan will be turned back to the Ministry of Health, and if so, when. We cannot predict at what rate the Ministry of Health may be able to turn over treatment facilities to municipalities and charitable agencies or to what extent it may be able to increase its budget and expand its public health activities.

In short, as we indicated earlier, an agreement was reached among all of the public health groups in Iran as to what public health activities the Seven Year Plan should undertake and upon the general priorities of these activities. A budget allocation prior to more detailed planning can give only a general indication of the approximate distribution of funds among various projects. One should examine the overall tentative budget shown in Exhibit A-17 with these facts in mind.

EDUCATION

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EDUCATION

OBJECTIVES AND SCOPE OF INVESTIGATION

At the outset of our studies, we encountered two predominant, but widely differing, viewpoints as to the part which education should take in an economic development program such as the Seven Year Plan. Some held the view that expenditures for education should be limited to a stop-gap or emergency technical training program. Others believed that the emphasis should be on the long-range cultural development of the nation which would include the establishment and expansion of museums, the encouragement of creative writing and research, and the preservation of historic monuments and cultural treasures.

It seemed that neither of these divergent viewpoints would fully meet the need for an educational program to aid in mobilizing the entire resources of the nation, including its manpower skills and potentials, for the purpose of developing the national economy and raising the standard of living of the people. It was then generally agreed that a more practical and fruitful objective would be to limit all educational expenditures under the Seven Year Plan to projects which would meet the needs of the moment and would also be consistent with a co-ordinated long-range program involving the use of all pertinent educational facilities to raise the level of national well being.

Accepting this broad objective, in turn, led to the direction of the survey of Iran's educational system into three principal channels:

1. To determine an ideal educational goal which, although it might not be completely attainable in the immediate future, nevertheless would contribute most to the ultimate development of the nation and to the standard of living of its people.
2. To recommend a series of specific projects which would be linked directly to the fulfillment of the Seven Year Plan but which, at the same time, would fall within the framework of a desirable long-range development of Iranian educational facilities and methods.
3. To suggest a series of priorities for the implementation of these specific educational projects, indicating their relative merits.

Once these objectives were determined, we investigated the Iranian education system as a whole. Unless efforts directly aimed at assisting the Plan are co-ordinated with the existing educational system, confusion will be certain to result, nothing of lasting value can be accomplished, and Iran will be left in no better position to meet the requirements of a continually expanding economy at the end of the Plan period than it was at the outset. Moreover, many of the existing educational facilities are vitally essential to the Plan's success; for example, the technical and economics faculties of the University of Tehran, the honaristans and teacher training schools of higher and secondary levels, the night schools, industrial training programs, and similar elements of the educational system.

Accepting the aforementioned objectives also required a sharp delimitation of scope and the rejection of a number of proposals presented by the Provisional Planning Board. Public health education and instruction in agriculture above the secondary level, for example, were allocated to the public health and agricultural development programs, respectively, because these programs dealt primarily with the aforementioned subjects and also because the limited appropriation for education required a most careful husbanding of the available financial resources. Similarly, it was necessary to dismiss the proposal for the establishment of 40 technical colleges and 35 technical training colleges. This was done because present facilities now are used to only between 10 and 20 per cent of capacity, the proposed curricula bore little relationship to either present or future industrial needs, salary scales were too low to attract competent personnel, and the cost of the program was entirely out of proportion with total national needs.

METHOD EMPLOYED

No educational survey can ever be complete. Iran's great area and scattered population required the use of a sampling technique. An attempt, therefore, was made to study intensively a representative sample of cities, towns, and villages in characteristic areas chosen on the basis of agriculture, climate, geography, ethnic considerations, traditional attitudes, concentration of population, and educational facilities.

In the course of conducting the survey, previous economic and educational surveys were examined; statistical and descriptive material furnished by the Provisional Planning Board staff, the Ministry of Education and others was studied; 190 schools of various types were visited in nearly 40 cities and towns and in 14 villages scattered throughout Iran; interviews were held with former Ministers of Education, other outstanding educational leaders, with members of educational councils, teachers, factory owners, managers, tribal chiefs, and many others. Splendid and frank co-operation was secured from many officials and teachers who, conscious of the shortcomings of the nation's educational system, were anxious that it be developed in keeping with Iran's needs and opportunities.

It has been necessary at times to be critical of present facilities and methods in conducting the survey and appraising current accomplishments. If this criticism occasionally seems severe, it should be remembered that it is offered in a constructive spirit of helpfulness and of directing all efforts toward the goal of an educational system worthy of a nation with a great past and an even more hopeful future.

BASIC EDUCATIONAL PHILOSOPHY

A study of the Iranian educational system as a whole necessarily began with its foundation, the basic educational philosophy of the country. Otherwise it would have been impossible to evaluate the system in terms of material needs or to plan wisely for specific projects designed to facilitate the progress of the Seven Year Plan.

One feature stood forth clearly in the ensuing appraisal: the principal point of weakness in the educational structure of Iran is its educational philosophy. The existing school system has been relatively successful in accomplishing the apparent aims of its founders three-quarters of a century ago, which were to produce a distinguished intellectual elite and to establish an instrument by which the thoughts and actions of the common people might be efficiently manipulated. The existing system is anachronistic and unsatisfactory because of a changed social philosophy rather than because of technical failure of the schools. There is today general agreement that the nation's educational system has failed to meet the needs of modern Iran to date, and that it is even less equipped to cope with the complex demands of an expanding modern economy and progressively growing society.

Five streams merge in the educational philosophy of the Iranian nation. The first of these is the Farsi or heroic tradition, exemplified in the ruins of Persepolis, the shrines at Ghum and Meshed, the mosques of Isfahan, and the glorious Persian art treasures found in many museums of the world. The second stream is the feudal agricultural economy and its implications, concerning which enough has been written in other sections of the report to make further comment unnecesary at this point. The poetic tradition, established by Persia's great poets and perpetuated in its present culture, is a third stream, while the fourth comprises the influence of Islam as expressed in its moral teachings, architecture, art, and similar features. The fifth and final stream is the tradition of French education which Iran has adopted within its more recent history. The older streams are too well known to require further comment, but the French system of education, and its implications and results, require a more extensive statement.

The French system of education, as adopted in Iran, has been essentially authoritarian, highly centralized, and based upon a theory of the encyclopedia of knowledge. The French justified their advocacy of an authoritarian administrative structure and teaching methods on the grounds that those best qualified to lead obviously should lead, and that it was natural for the intellectual elite, the relatively few people with the native capacity to be highly educated in any society, to guide the affairs of the masses. This being the case, the intellectual elite should be gathered together to render mutual assistance and to reinforce their respective individual efforts.

A number of unfortunate results stemmed from this basic assumption. Since a wise (which was interpreted to be synonymous with educated) man obviously would know best what education was necessary for the uneducated, the intellectual elite were called upon to determine what should be taught in the schools. The curriculum, therefore, was based upon the relatively limited experience of the intellectual elite and came to revolve around an assumed core of indispensable knowledge which it was thought all citizens should possess. This core was inevitably slanted toward the theoretical. Moreover, the entire system, its curriculum, and its methods, were imposed upon local educational units with little or no allowance for originality or modifications to meet local requirements.

The psychological and administrative results of this system comprise serious impediments to the national development of Iran. Those in high positions who have completely adopted this system, although they by no means include all of the nation's educational leaders, often unconsciously distrust the efficacy of the system; consciously or unconsciously doubt the ability of the local official to interpret, modify or administer their ideal plans; place little reliance in data gathered by subordinates in whose training and ability they have but limited confidence; and therefore tend to seek refuge in highly detailed regulations and ever stricter supervision. The tighter their controls become, the more rigid, uniform, theoretical, and unworkable becomes their ideal plan, and it is thus foredoomed to failure.

This type of educational system works equally badly for those who are to be educated. At least 90 per cent of the population remains illiterate, although this cannot by any means be laid entirely at the doorstep of the French system. A severe but not too complicated system of social, economic, and educational barriers within the school system eliminates all but a predetermined few from competition for coveted economic positions. Only an infinitesimal minority manage to break through these barriers, as, for example, a gifted boy who enters industry as a semi-skilled workman and eventually wins the right to study for a skilled labor or professional position at company expense. The result is a tremendous wastage of potentially skilled manpower and national leadership; a wastage which, in view of Iran's present and future needs, the nation can ill afford. Iran cannot afford to perpetuate conformance to a prescribed intellectual pattern required for advancement under the present system; the development of a stereotyped, theoretical, and academic type of training; or the rejection of the social mobility which once was the nation's boast in favor of a stratified society based upon inflexible educational requirements.

Since over-centralization of administration and methods, a spirit of theoretical perfectionism, and an inclination to unrealistic paper reforms rather than fundamental changes, are inadequate to meet the perplexing and critical challenge of the rapidly changing modern world, it is obvious that Iran needs a new educational philosophy; one in keeping with the needs and opportunities of the times. Without this essential step, it is almost inevitable that the Seven Year Plan funds spent upon education will be dissipated without any lasting benefit to the nation. The question therefore arises as to what should be the nature of the new educational philosophy.

Whatever educational philosophy is finally adopted, it should result in the production of a trained and responsible leadership; in the development of free and original research; and in the growth of a skilled, informed, and self-reliant citizenry. The system employed should be decentralized and democratic, putting its faith in the inherent ability and strength of the great mass of Iranian people. It should provide these people with the educational equipment with which to use their natural aptitudes fully and to make up their minds intelligently. Iran's need for trained leaders and for countless others to perform manifold humbler tasks is so great that nothing less will suffice.

Iran's need, therefore, seems to be an application of the educational philosophy developed in the western democratic world, and upon which the economic and social accomplishments of nations such as the United States so largely have been based. The very fact of the Seven Year Plan, plus the clearly indicated objectives of the nation's forward-looking educators, shows that Iran is ripe for such a development. This educational philosophy places its faith in the inherent ability and worth of the individual and in his capacity for development. It is oriented toward the production of an educated citizenry rather than a small intellectual elite. It believes that only by spreading the opportunity to practice leadership and self-direction as widely as possible can there be created a sufficient number and quality of leaders to meet national needs.

The resulting system, therefore, aims at retaining the highest possible percentage of students in the educational process; of salvaging the maximum number of borderline cases; and of redirecting into other and more appropriate educational channels those who, while they may not have the capacity to meet the requirements of a specific program, nevertheless will inevitably be citizens and therefore must be made into the best citizens possible within the limitations of their native ability.

A free or elective curriculum is employed. This is justified on the grounds that the sum total of human knowledge is so incalculably great that no single extracted core can possibly be advanced as indispensable. It is held that the pressures of history and of current society are more accurate guides to the necessities of the curriculum than are the personal opinions of any group of people who may claim to direct the cultural development of a nation on the basis of their previous training. The free or elective curriculum is also based upon the assumption that it is possible to learn the techniques of thinking and acting intelligently about as easily from handling one type of subject matter as another. Logic, for example, can be taught just as easily by studying current events as by studying mathematics or Arabic grammar. Furthermore, it is held that training should approximate as closely as possible the real life situation which may be expected later. As a result of this general attitude toward training, the curriculum is made as broad and varied as possible, and major emphasis is placed upon a practical rather than a theoretical approach to knowledge.

Finally, the educational system emanating from such a philosophy tends toward decentralized administration. This is justified on the ground that it is possible to tap the real leadership of a country only by drawing upon the talents and experience of as many people as possible. It also is based upon the assumption that wisdom and leadership are not necessarily limited to those with the greatest formal education, but are complex qualities which may be found at any level of society. Decentralization is advocated because it serves as a barrier to usurpation of control and deliberate manipulation of the educational system for the ends of any minority. Finally, decentralization is favored because it has proven to be the only pattern of administrative control which permits adequate variation to meet local needs.

It is this general form of educational philosophy, adapted in its details to meet special Iranian needs, which is recommended as the essential new foundation for both the educational program involved in the Seven Year Plan and the longer continuing development of an educational system equal to the demands and opportunities of a growing and progressive nation.

THE PRESENT EDUCATIONAL SYSTEM

The present educational system may be divided roughly into two essentially different elements: its broad general characteristics, and the detailed mechanisms used in its operation. The first of these may be subdivided into: attitudes and psychological patterns; administration; and schools. The second includes an almost limitless array of instruments of the teaching process, the most important of which may be grouped under the following heads: curriculum; methodology; textbooks and teaching material; teachers; guidance; supervision; laws; finances; and construction.

An attempt has been made, in considering each of these components of the formal educational process in Iran, to select and describe the essential national pattern, if one exists; to present pertinent statistical, legal, or organizational material, where available; and to evaluate findings. Typical examples taken from field studies have been used wherever possible as substantiating evidence.

ATTITUDE AND PSYCHOLOGICAL PATTERNS

It is always dangerous to attempt to classify the national psychological characteristics of a people; and especially so for the foreign observer. In no culture, and certainly not in Iran, does there exist any group of characteristics which are universal. All apply at best to only certain groups of the population, and only to certain individuals within those groups. But it may be possible to discover a number of fairly generalized, discernible attitudes and psychological patterns in the Iranian society, and to pick out certain ones which appear to have direct bearing upon the economic productivity and future standard of living of the people. Such attitudes and psychological patterns, if they could be discovered, would have very great pertinence to any educational program contemplated under the Seven Year Plan.

There appear to be at least five elements which may be considered assets from the viewpoint of potential economic production. The first is a great tradition of culture. Iran is a nation which historically has produced some of the top level of science, poetry, logic, architecture, and even political and military organization. Akin to this great tradition of culture has been the tradition of craftsmanship to which modern Iran is the heir. There is hardly a village or tribe which has not developed some indigenous form of craft. There also can be little doubt that the Iranian people have a tradition of high appreciation of beauty. Their sense of design is unsurpassed. Persian miniatures are world-famous; the Persian garden is legendary even in Western literature, and the poorest tribal family creates its own beauty in rugs, saddles, bridles, clothing, and folk-tales.

There are two other traditions which appear characteristic in modern Iran: a high native intelligence and a spirit of great intellectual inquisitiveness. Whenever Iranian students have been brought into direct competition with comparable students of other lands, they have clearly demonstrated their ability despite the handicaps of language and different cultural backgrounds. The history of Iran is that of a succession of brilliant thinkers—philosophers, mathematicians, astronomers—who have been pre-eminent in the world of their age. Intellectual curiosity of a type having direct economic value to the Seven Year Plan is apparent in the incessant tinkering, and the desire to know how machinery is constructed and operates, which can be seen wherever Iranian labor comes in contact with the products of western manufacture.

There also are certain other less helpful characteristics with which Iranians frequently charge themselves: a generally low level of public and private honesty and responsibility; a tendency to seek to hide shortcomings and errors either by pointing to past greatness or else finding a contemporary scapegoat; an excessive desire for immediate and exorbitant profit; little or no confidence in the long-range future; a distaste of hard, disciplined effort once a certain social and educational level has been reached, and a generally low opinion of physical labor; lack of personal initiative and undue dependence on Government; a tendency to accept social stratification without complaint and to conceive lack of advancement or misfortune as a visitation of fate; and a too uncritical acceptance of foreign cultural patterns. Many of these alleged characteristics, to the degree to which Iranian observers may be correct as to their existence, tend to arise out of historic, economic, and social causes which lie deeper than the shortcomings of the educational system. Nevertheless, they vitally affect the development of a modern system and the success which may be possible to the educational projects undertaken by the Plan Organization.

ADMINISTRATION

The administration of the formal educational system of Iran is a highly centralized, bureaucratic, line-and-staff control under the direction of the national Ministry of Education. In addition to this formal system, there are a number of independent and autonomous educational organizations, and a series of educational endeavors by other Governmental agencies than the Ministry of Education. Since the formal system is much the most important, both in size and in influence upon the economic productivity of the nation, it will be considered first and in greater detail.

The Ministry of Education is organized under the legal sanction of "The Administrative Law of the Ministry of Education, 11 Shahrivar 1289", with certain modifications made by subsequent laws but not by formal amendments.

The current organization is headed by a Minister of Education, who is a member of the Council of Ministers, and tenure of office is entirely dependent upon the stability of the incumbent Government. Immediately below the Minister is the Under-Secretary of Education, appointed by the Minister and presumably exercising technical direction over the organization. In practice this position is equally subject to the vagaries of the political fortunes of the successive Governments. Under the Under-Secretary are four Secretariats: that of the Ministry, the Higher Education Council, Higher Education and International Cultural Relations, and Theological Sciences. Each of these exercises administrative supervision over educational and cultural functions indicated in their titles.

On an equal status with the Secretariats are four bureaus, Educational, Administrative, Painting and Fine Arts, and Bequests, each under the technical and administrative supervision of a Director General. Each of these is subdivided into a number of divisions or departments: Educational, dealing largely with the schools and instructional programs; Administrative, concerned with finances, construction, personnel, inspection, and supplies; Painting and Fine Arts, involving libraries, museums, archeology, and similar cultural endeavors; and Bequests, dealing with the adminstration of funds from Pious Foundations and other philanthropic sources. A schematic diagram of the organization of the Ministry of Education is given in Exhibit B-1.

Below the national Ministry of Education are the ostans and municipal offices of education. The ten ostans roughly follow the old provincial boundaries. Subdivisions of these are the counties, or shahrestans. Within these sub-divisions are the municipalities, which usually include in their political jurisdiction certain villages which may be Imperial domains, Pious Foundations, or owned by private individuals. There are offices of education in each of the ostans, some of the shahrestans, most of the municipalities, and in occasional villages,

The educational administrative control, however, does not necessarily follow down the descending order of political subdivisions. It has been considered politically desirable to secure a direct administration from the national Ministry of Education for certain of the larger sub-units, and within an ostan there are frequent instances of a shahrestan or a municipality dealing directly with the Ministry of Education and by-passing its ostan office of education. There are forty-two offices of education having direct access to the Ministry of Education, a list of which is shown in Exhibit B-2.

The most important characteristic of the administration of education is that the central Ministry controls virtually every function—finance, construction, supervision, the preparation and appointment of teachers, the examination of students, the curricula, textbooks, methods used in teaching, even the minutiae of such things as library practices—with an absolute and complete authority. In only two instances do there appear to be evidences of decentralization through the allocation of administrative authority to subordinate groups: in the permission to municipalities to impose certain local taxes for the financing of school construction; and in the establishment of local councils of education to advise the ostan or municipal educational director in the interpretation of Ministry of Education basic policy. Yet even these two instances are so completely regulated by the central authority of the Government that they are more an appearance of decentralization than a reality. For example, the membership of the local councils has to be approved by the Ministry of Education after the names are submitted.

The existing administrative organization is technically inefficient, standardized and stereotyped, discourages initiative and leadership, and deprives the local people, both lay and professional, of the opportunity of participation in the formal education of their children. A few examples will illustrate these characteristic deficiencies.

Even if a centralized, bureau-type administrative structure were considered desirable or essential, the existing structure is highly inefficient. The decision of whether a municipality shall or shall not have direct administrative linking with the Ministry of Education appears to depend much more upon the interest and energy of the deputy representing that constituency in the Majless than it does on any inherent characteristic of the geographical location, local educational needs, or population concentrations. Dizful, for example, comes under the direction of Ahwaz, yet Khorram-shahr does not. The desert town of Tabass, separated by nearly 600 km and two mountain ranges from Meshed, is under that ostan capital, yet Nishabur, only 160 km away on a good road, is an independent system. The internal inefficiency of the administration need not be detailed.

Personnel wastage is very high. The number of employees in the national Ministry of Education, 683 staff and 210 servants, is far too great and could be cut to one-third, with a gain rather than a loss in efficiency. Cutting the theoretical six-hour work day by absenteeism, tardiness, and wasteful office techniques is common practice.

Economic wastage is equally apparent. Certain of the administrative functions are borne by other Ministries. Fiscal control, for example, is exercised by the Ministry of Finance without an accurate cost analysis of what proportion should be charged against education, thus making it virtually impossible to estimate what percentage of the Ministry of Education budget is chargeable for administrative costs.

But at the utilization end of the process it is possible to get a rough approximation of what enormous overhead, and consequent inefficiency, the system imposes. In one city in the eastern part of the country, two nearly identical schools have been built at the same time under the administration of the same local school director. One was financed nationally and therefore had to absorb the costs of complying with national administrative regulations. The other was built with local funds and could adopt local methods of fiscal control. The locally-financed school has been completed at a cost of Rls. 250,000. The nationally-financed school originally was authorized to be one of two such institutions, each to cost Rls. 500,000, and for which a total credit of Rls. 1,000,000 was granted. It was contracted for at the estimated price of Rls. 800,000 for the single school, has so far cost Rls. 1,168,000, and it is estimated will cost Rls. 1,400,000 before completion, at nearly six times the cost of the locally-financed one, with only the slightest difference in construction and quality.

Comparative costs of boarding students in nationally-supervised and locally-supervised institutions in similar areas show that the per unit costs of nationally-supervised schools run as much as three times that of the privately-administered, yet almost invariably suffer in comparison as to quality. Thus, in one city in the south, the costs are Rls. 200 per month for the private and Rls. 600 per month for the national institution. The local educational official has no opportunity to exercise his administrative ability, and is hemmed in by so many restrictions that he is almost forced to be wasteful and inefficient.

The system is stereotyped and over-standardized. There is one elementary school curriculum for the entire nation. Even the hours of the day are prescribed. In certain tribal areas, for example, near Bam, the tribes are in motion during the spring and fall, but spend seven to eight months in summer and winter pastures. If the schools could be scheduled for the periods of sedentary living, and the periods of migration be made vacations, the children might be given schooling. This is not permitted and the children therefore are barred from compulsory education. Children of nine to twelve years of age are enrolled in night schools all over the country, destroying their eyesight in the dim light, losing sleep, and walking through the worst parts of the city late at night. Many take courses during the day from private teachers, for which they pay a fee, but others do nothing. This occurs because the regulations prevent children of nine years or older from entering the first class of the elementary school, but not from entering the night school.

Children in villages, if they have a school at all, read the textbooks prepared for children in Tehran. The secondary school in Gonbadegaboos, composed almost entirely of Turkoman tribal children, requires the study of French. The technical school of Meshed, a honaristan, not under the Ministry of Education, teaches metal work and cabinet making, while the five industries of the city are a grain elevator, textile mill, sugar plant, carpet factory, and electric power station. The men's teacher training school in Shiraz teaches bookbinding and highly artificial woodworking, mainly fretwork with a scroll saw, despite the fact that neither has any practical or commercial application to the community. Many other similar examples of misplaced effort could be cited.

While it is true that the administrative system discourages local incentive and leadership, this observation fortunately must be modified in detail. The average educational official, from a Director General in the Ministry of Education down to the teacher in a two-class village elementary school, can count on promotion and continued tenure of office with far greater certainty if he never diverges in the slightest degree from his instructions from above. In brief, it is not doing wrong, rather than doing right, which in practice proves most profitable.

Under such conditions, it is the rare official who is willing to risk his professional position by ignoring or modifying the official order. Yet a few do exist. One is an outstanding official in an unnamed city who directed that the school libraries be opened to the children and that they be permitted to withdraw and read the books. He interpreted his educational duty as a higher order than the administrative direction which made him virtually a custodian of books as national property. In all parts of the country, with the exception of a few cities of great conservatism and tradition, officials are quietly ignoring the order to stop co-education and are permitting classes with boys and girls in the early grades on the grounds that it is a financial necessity if schools are to be supplied. They point out that, after all, the children play together at home and in the streets.

The highly centralized administration also has discouraged lay participation in educational affairs. But in a limited number of schools and cities there are now organized parent-teachers associations, called "Home and School Co-operative Society" (Anjoman-e-Hamkari e Khaneh va Madrasseh) authorized by the High Educational Council on 9 Aban 1326 (1947). In addition, in a limited number of ostans and municipalities, there are educational councils which serve to advise the local educational director on matters of policy. In some others, they are purely perfunctory, with personnel which in practice defers completely to the desires of the educational director, and through its passive attitude negates the purpose of such an organ.

The educational administrative structure, which does not come under the Ministry of Education directly, contains three types of organizations: semi-autonomous bodies such as the University of Tehran, although it should be noted that the University of Tabriz is under the Ministry of Education; schools which are under another national Ministry, such as the five existing technical schools (honaristans) under the Ministry of National Economy, the Tehran Trade School under the Ministry of Labor, the Railroad Technical School under the Ministry of Roads; the Higher Institutes of Hygiene, under the Ministry of Public Health; and a certain number of private schools which must conform to an official national curriculum but which are free to operate under their own administrative direction, such as the Technical Institute of the Anglo-Iranian Oil Company in Abadan. Since these are largely isolated schools, or at most small groups of similar schools and not, properly speaking, administrative systems, they will be considered in the next section.

SCHOOLS

The third major element of the existing educational structure in Iran is the formal school system. There are ten types of schools in current use: kindergartens, elementary schools, secondary schools, higher schools, teacher training schools, technical schools, special schools, night schools, religious schools, and mass education media.

Kindergartens

Kindergartens are almost exclusively co-educational, private, fee-charging, and limited to large urban areas. In Tehran, for example, there are 32 private but no Government kindergartens. They vary widely as to quality. Thus, in some kindergartens discipline is severe, and the children sit rigidly in rows in utter silence until told to perform some studied act, which they accomplish with a complete lack of spontaneity. In the best kindergarten visited, located in Shiraz, the children played with complete naturalness, moved about, sang, worked in their garden, organized themselves to clean up the classroom when the school-day was over, practiced simple hygiene, and demonstrated an astonishing interest and ability in reading and writing, normally considered an elementary school subject. The spirit of this school, which may be considered near-ideal, was that of complete freedom, yet of a remarkable degree of self-discipline and order.

Elementary Schools

The elementary schools are of two types: four-grade schools usually found in villages and the complete six-grade schools taking children from the age of seven through fourteen, found in some villages and in all urban areas. In some villages there are two-room schools. These are four-grade schools, one room holding the first and second grades, the other holding the third and fourth. Regardless of who owns the property (the Ministry of Education, the local municipality, a private organization or individual, or a Pious Foundation), the curriculum is rigidly prescribed by the Ministry of Education, and virtually all operating conditions are equally prescribed.

The majority of the buildings are rented and in these the hygienic and educational conditions are in general deplorable. Wherever there are enough students to fill the schools, classes of 40 are usual and ones of 50 and even higher are not uncommon. The spirit of the schools is almost invariably rigid, authoritarian, and severe; almost the only exceptions being private schools which are dominated by the personality of some gifted individual.

Even newly-constructed schools are usually dirty. The teachers are obviously underpaid, frequently shabby, uncleanly, and indifferent. Simple reading, writing, the most elementary arithmetic, and certain moral teachings (a part given in Farsi and a part given in the original Arabic which the children and usually the teacher do not understand) constitute the core of the studies. There is absolutely no concession made to the demands of the local community.

The textbooks are inappropriate, badly printed, usually tattered and dirty, and economically unavailable to the majority of the children. Even the best elementary schools can improve these general conditions only with regard to the more superficial aspects of education. They can have new buildings, clean schools, better-paid teachers (by incentive pay from private sources which adds to the official scale), and a somewhat less formal atmosphere. But basically all elementary schools of Iran are forced to comply with regulations which, if applied to the finest modern school, would make it largely ineffective.

Secondary Schools

The secondary schools are universally segregated; that is, they are not co-educational. The course of studies is divided into two cycles: the first three years in both boys' and girls' schools being considered general and cultural in character; the second cycle in turn being divided into two years of general work which might be considered of a terminal character, and a final or sixth year of work designed for preparing the student to enter one of the Faculties of the University. Some secondary schools terminate with the first cycle, either for financial reasons or lack of students. The majority are of five years' duration. A few give the full two cycles with a total of six years.

With the exception of a few private secondary schools, each of which would have to be judged individually, the official secondary schools of Iran may be conveniently divided into two classes: those built or authorized during the tenure of Dr. A. A. Hekmat as Minister of Education, and the rest. The Hekmat schools are generally well designed (for the existing program) and constructed, and are almost luxurious among the public buildings of Iran. The remainder are frequently located in very old or rented buildings which are inadequate for any school with any program.

The same criticism of the overcrowded classes, the rigid and inappropriate curriculum, the indifferent quality of teaching, the slovenly and unkempt general appearance of the buildings, and the authoritarian and formal atmosphere which was made of the elementary school may be made equally of the secondary schools. To this must be added the far more damaging criticism that, whereas the elementary school at least taught its graduates to read and write, obviously useful tools for life, the secondary schools have produced graduates who apparently are not fitted for anything after graduation but to continue their schooling or to enter teaching.

Higher Schools

The third type, higher education, contains institutions of two levels: higher technical schools which do not have university status (honarsara), such as the higher course of the private Technical Institute of Abadan and the Tehran Higher Technical Institute under the Ministry of National Economy; and the two universities of Tehran and Tabriz. Both levels of these institutions require graduation from the full six-year level of the secondary school with the twelve-year certificate, as well as certain course prerequisites and examinations.

The two institutions in Tehran will serve as examples. The Higher Technical Institute offers a three-year course of studies in each of three specializations (chemistry, mechanical engineering, and electrical engineering) leading to a certificate as a junior engineer, but not the title "Engineer" which is reserved to the university graduate.

The University of Tehran has by authority of its charter six Faculties: Literature, Philosophy and Pedagogy; Law, Economics and Political Sciences; Medicine; Engineering; Science; and Theology. There have since been annexed to the University four institutions having approximately Faculty status: the Higher Teachers Training College, the School of Fine Arts, the Veterinary College, the Agricultural College; and a number of subordinate departments such as the College of Midwifery, the College of Nursing, the College of Hygiene and Public Health, and the Department of Islamic Preachings.

In general the buildings are good, the equipment adequate, the professors well trained, and the libraries, shops and laboratories relatively much better than the schools of lower levels. However, the facilities are still not adequate. The engineering, technology, science, agriculture, and veterinary courses are the ones which have most direct application to the Seven Year Plan and are the ones referred to when detailed mention is made of the institutions.

Any general criticism inevitably suffers from lack of precision, and a detailed criticism would require a far more accurate and minute investigation than is possible under the present conditions. But in broad outlines the technical training at the university level may be said to lack sufficient practical experience in industry, laboratories and shops; to suffer from an inadequate technical literature available in translation or in an easily accessible European language; and to lack direct application to the scientific and industrial needs of Iran.

Teacher Training Schools

Teacher training is conducted at two levels. The majority of trained elementary school teachers are educated either in the ordinary secondary schools or in a two-year course which follows the first cycle of the secondary school. The secondary school teachers are trained either in one of the Faculties of the University or in the Higher Teachers Training College, which holds a position nearly equivalent to that of a Faculty in the University. It is estimated that approximately two-thirds of the existing elementary teachers, however, have only elementary school training themselves.

The two-year teacher training schools are invariably segregated, and are located in the ostan capitals and certain large cities. Despite the nation-wide teacher shortage, there has been apparent for the past few years a tendency to close many of these schools or to convert them to ordinary secondary schools. This is explained on the grounds that there is so little mobility among the graduates, especially among women, that the schools quickly glut the market in the immediate vicinity, while failing to fill positions which are open at some distance from the city.

The course is secondary in level and suffers from the same criticisms as did the ordinary secondary schools. All men's teachers training schools are boarding schools, with room and board supplied as an incentive to poor students and to students from outlying areas, who are encouraged to return to their villages to teach after graduation. The Government investment in the living of these students entails an obligation to work for the school system for five years or to repay the cost.

The Higher Teachers Training College is a three-year, co-educational school for the training of secondary school teachers, located in Tehran and administered as an annexed part of the University of Tehran. Since 1312 (1933), the Director of the Faculty of Arts and Literature has automatically held the position of Director of the History Teachers College. The Rector of the University jointly holds that position and also the position of Director of the Faculty of Arts and Literature. Since these two posts occupy much of his time, the actual administration of the Higher Teachers College is left to an Acting Director. Such an arrangement does not tend to lend prestige to the College nor increase its efficiency.

The College accepts graduates of the secondary schools holding a twelve-year leaving certificate from the mathematics, science, or literature sections; a limited number of graduates of the ordinary teacher training schools who hold a twelve-year leaving certificate from a secondary school; undergraduates from one of the other Faculties of the University; and graduates of a Faculty, all on the basis of competitive examinations.

The graduates of the teacher training schools who are admitted are granted full pay and tenure, exactly as if they were actively teaching, but must accept an obligation to teach for five years upon graduation. The graduates of other Faculties are admitted with one year advanced standing, but are not eligible for free board and lodging granted the regular students.

The library has 17,800 books, is classified and indexed according to the Dewey Duodecimal System, has an annual budget for purchasing new books, and is one of the very few really effective libraries in the country. The laboratories need modernization and equipment in some cases, but the physics laboratory is excellent. When the Faculties of Literature and of Science move out of the Higher Teachers College buildings into their own quarters, this school will have more than adequate equipment.

The general prestige of the College is unfortunately rather inferior to that of some of the other Faculties, partly due to the restricted income which its graduates must expect, and partly due to the fact that it draws upon the other Faculties for part-time professors who do not consider it their major interest. In part this is also due to the fact that the Higher Teachers College, which historically was the very basis of the University, has now been reduced to a staus of an inferior part of it.

Technical Schools

The technical schools of Iran are not under the direct administration of the Ministry of Education. There are five types: elementary, secondary, higher, university, and specialized.

An elementary artisan training school offering three post-elementary courses of from one to three years each is located in Tehran and is under the direction of the Ministry of Labor. The secondary level skilled artisan training schools known as the honaristans offer a six-year course in a choice of specializations (usually metalwork and woodwork), under the direction of the Ministry of National Economy. A three-year higher technical course known as the honarsara, requiring for entrance a full twelfth-year leaving certificate from the mathematics section of the six-year secondary school, also is under the direction of the Ministry of National Economy.

The four-year higher educational course of the Faculty of Engineering in the University of Tehran, requires for admission a full twelve-year leaving certificate from either the mathematics or the scientific section of the secondary school, and grants upon graduation the title of Engineer in one of four areas of specialization: Civil, Mining, Electrical and Mechanical, and Chemical Engineering.

Finally, there are a number of private technical schools maintained by major industries for the preparation of their own production and maintenance personnel: for example, the Railroad Technical School (Honaristan-e-Rah-Ahan) in Tehran maintained by the Iranian State Railways under the Ministry of Roads; the Special Training Schools of Posts and Telegraphs (Amoozeshgah Ekhtesagi Post va Telegraph) in Tehran administered by the Ministry of Posts, Telegraphs and Telephones; and the complicated series of training programs conducted by the Anglo-Iranian Oil Company.

It is impossible to generalize with any accuracy upon these several technical training schools. The elementary school under the Ministry of Labor—the Technical School of Royal Social Services Organization—has a good building newly constructed of fired brick and fair equipment largely consisting of German machines purchased second-hand in the Tehran area at a total cost of Rls. 2,000,000. Its curriculum is flexible and highly practical, but is probably far too extensive for efficient operation in a school of that size, offering no less than ten separate trades for a student body of 100 which could be increased to 300. The school is considered a prototype for a projected series to be constructed in other parts of the nation.

The original operating expense of the school was estimated at Rls. 80,000 per month but has been scaled down to Rls. 30,000, to which Rls. 25,000 must be added for the free lunch program. The per capita cost of Rls. 300 per boy per month can undoubtedly be lowered with an increased student body in the Tehran area, where the administrative staff are not paid a salary but are drawn from volunteers working in the Ministry of Labor. However, no accurate forecast of the per unit cost in the ostans is possible. The course is highly practical, and shop work takes precedence over classes in theory.

There are seven honaristans, or secondary level technical schools—five under the Ministry of National Economy; one under construction by the Anglo-Iranian Oil Company and the Government in Ahwaz which is to be given to the Iranian Government upon completion; and one owned by and located on property of the Anglo-Iranian Oil Company in Abadan. There are, in addition, two women's technical schools—one in Shiraz and one in Tehran. The buildings and much of the equipment of the Tehran school are adequate but rather old. The foundry is in the poorest condition. The chemical laboratories need modernization. The entire plant seriously needs major maintenance. The methods, staff, equipment, administrative direction, and success in meeting local industrial needs are substandard by American or European standards but may be adequate for Iran and are probably the best of the Government-operated schools. A purchase of £15,000 worth of new Czech machinery has now arrived and £30,000 worth of machines and laboratory equipment is on order in England.

The Ahwaz school is under construction and no classes have been formed or graduated. The Tabriz school is in the process of shifting from old to new buildings, which are still under construction at an estimated cost of Rls. 25,622,400. The schools in Shiraz and Meshed have recently moved into new fine buildings, although the equipment is far from complete. The Isfahan school has new shops and an adequate classroom building.

All of these Government schools are used to only a fraction of their capacity, and each would take 1,000 students without undue crowding if the work were properly scheduled. Actually the Tehran school is the only one which even remotely approaches this utilization. It once had 800 students and now has 273 in the honaristan and 120 in the honasara. Isfahan has 100, Shiraz has 100 boys, there are 50 girls in a separate building not connected with the school except administratively, and Meshed has 84.

The schools are greatly over-staffed for the existing student bodies. Many of the teachers are considered part-time, though they hold civil service rank and receive pay which presumably commands an obligation to work full-time if needed. Thus, the Tehran school has 46 instructors for 273 students in the honaristan, or a teacher-pupil load of 1 to 6. The optimum load in American and European schools is considered to be 1 to 20 for theory; 1 to 15 for bench work; 1 to 10 for machine work. Such ratios are rarely attained even in the best schools, yet the Tehran school is operating over all with nearly twice the personnel considered optimum for the most exacting form of instruction.

The Shiraz school had 18 instructors for 100 students—a ratio of slightly more than 1 to 5. The Meshed school had 21 instructors for 84 students—a ratio of 1 to 4. The ratio for the Isfahan school cannot be estimated since parts of the school have actually been converted to what amounts to a small, subsidized, relatively inefficient commercial factory, with the instructors, and even hired labor, manufacturing things for sale while not a single student is enrolled in certain departments.

The most serious criticism is that the work offered is quite unsuited to the needs of local industry. Thus, the curriculum in the Tehran school was set up twelve years ago by the German staff then directing the school and has had only minor modifications since that time. The Isfahan school, in a city which produces textiles and silver work, has no work in textiles except three looms, out of seven available, working on commercial orders for brocade, no design, no silver work, no rug or carpet work. It does have an art section of indifferent standards, a ceramic section with no students, and the traditional woodworking and machine shop. The Shiraz school, also in a textile area, has cabinet work and metal work, principally machine shop. In a city with five industries, the Meshed school offers woodwork and metal work. In the past fourteen years, 33 graduates have been employed in the Meshed area, 8 as policemen and 23 in the sugar plant. No job analysis is conducted by any of the schools, although the Tehran institution does have a faculty and industry council discussing possible curriculum changes.

Unquestionably the best of the honaristans is at Abadan, privately operated by the Anglo-Iranian Oil Company. It has the great advantage of offering its students modern equipment, an excellent library, absolutely first-quality teaching staff, and direct contact with a large, modern, highly efficient industry. The graduates know where they will be employed and the school administration, by a systematic and continuing job analysis, knows exactly what the industry needs in the training of the students. The students are under industrial discipline, are offered the incentive of pay while studying, and are in an atmosphere of seriousness and efficiency. The result is an excellent industrial school, the equivalent of the best in America and Europe which train for similar occupations. Although exact figures are not available, the per capita cost of instruction must be high, but this is borne as a personnel cost and ultimately as a production cost. The efficiency rate of instruction, however, is very high, with a wastage rate which, although higher than in an American school, probably due to the climate and work conditions which the students must face, is still very much less than in the Government schools.

The remaining types of technical schools may be appraised quickly. The honarsaras, including a Government one in Tehran using the same installation as the Tehran honaristan, and a private one called the Technical Institute of the Anglo-Iranian Oil Company, in Abadan, train practical junior engineers. The results seem satisfactory, but the proposal to increase these schools to university status seems premature and unwise. There is a considerable need for labor supply of men given higher training, but given training on a very practical rather than theoretical level.

The Faculty of Engineering in the University of Tehran has an excellent building, an adequate library, a staff of adequate quality, good equipment (especially since receipt of the machines and apparatus from the Anglo-Iranian Oil Company) and a program of theoretical studies that is acceptable. Its greatest defect is in lack of sufficient practical application of the theory in the curriculum. The graduate engineering students appear to be quite competent in theory but incapable of doing good work in practice until they have been given experience in industry. The chemical students are quickly brought up to industrial standards, but the electrical and mechanical students must face a relatively long apprenticeship, sometimes two to three years, before they can be trusted with supervision of complicated industrial processes and machinery.

Because these graduates consider themselves qualified engineers by reason of their degree, the emotional and intellectual readjustment is severe. Frequently they reject the absolutely essential period of seasoning; a period in which they must work side by side, and frequently with an embarrassingly lower status, with skilled artisans who have only an elementary school certificate.

A second shortcoming is that the course for the individual is usually too broad in its coverage. This is justified officially on the grounds that an engineering student in Iran can never know where he will go or what type of work he will be able to secure, and hence must be trained in all. To some degree this is true in all countries. But the impossibility of giving specialized work, and hence really preparing the student for actual industrial needs, in so wide a range of fields, ought to suggest a reconsideration of the basic premise, together with increased guidance to fit the specialized student into the available jobs in his field.

Finally, the specialized artisan-training programs operated in industry appear in the majority of cases to have failed rather completely. The Ministry of National Economy operated a textile school in Shahi, but two years ago closed it and removed the machinery to Tehran because of the political disturbances among the students, many of whom were working concurrently in the Mazandaran textile industries. This move, which was designed to obviate sabotage, was capitulation to complete sabotage through the discontinuance of the school and the immobilization of its equipment. The Tobacco Monopoly factory in Tehran, for a period of about two years, operated a training program for skilled artisans but discontinued this about six years ago and reverted to an unsystematic program of apprenticeship to fill the positions which have since become vacant. Skilled technical personnel is employed from the general Tehran labor market, men trained in mechanics, electricity, simple maintenance, and similar crafts in the local garages and workshops of Tehran.

The apprenticeship programs in the textile factories of Shiraz and Isfahan are so completely unsystematic that they can hardly be called programs. They cost the employer in the neighborhood of three per cent of the labor payroll in disguised training expense—breakage, wastage, lowered production—to fill personnel losses in what are generally considered to be static labor supply industries. This is about three times the cost of systematic programs conducted in foreign countries, such as Brazil.

The railway and the communications schools, both mentioned above, have supplied the demands of their particular industries with labor which is inefficient compared to foreign-trained personnel for the same positions. The building trades have been most backward in training; the production of plumbers, glaziers, masons, plasterers, carpenters, and painters being left to a haphazard apprenticeship tradition in which small boys work with rather indifferently trained masters until age or a short supply of labor elevates them to the position of a "master", or fully-qualified artisan. The results, as measured in the quality of construction work and the unit-cost, are grossly inadequate.

The only really adequate artisan training program in industry is that of the Anglo-Iranian Oil Company in its refinery area (Abadan) and its oil fields area (Masjid-i-Suleiman). This appears to be a well-worked-out, efficient program. Its wastage rate, however, is very high, ranging from 25 per cent in some categories to nearly 80 per cent in certain types of work where the trainee can expect far higher returns from his services as an independent operator in the bazaar than as a salaried employee. The cause of this abnormal wastage is complex: bad climate, unwillingness to submit to the discipline necessary in an industry of this type, housing, homesickness for the town of one's birth, technical unsuitability, and above all economic competition in a nation which has a short supply of adequately-trained skilled artisans.

Special Schools

The seventh type of school to be found in Iran is the special school, usually an individual school established to meet a specific need of a specific locality. Certain of the technical schools are undoubtedly of this type. The school for fishermen which was operated by the Société Mahie Iran at Pahlevi to train labor for sturgeon fishing and the extraction of caviar was of this type. The present status of this school is unknown. The several types of military schools, such as the Naval School in Khorram-shahr, are other examples.

The special schools having most direct application to the economic productivity of the country, and hence to the Seven Year Plan, are the agricultural schools. There have been three levels: elementary, secondary, and university level. Although all village schools are supposed to be rural in type, the elementary agricultural schools are really more a project than a reality. Thus, for example, Ostan 7 has two elementary rural schools which are supposed to have a program of agriculture in actual operation, the Takht-i-Jamshid School at Persepolis, and the Saadatabad School in the town of that name. When visited, both were found to have a perfunctory program of gardening in nearby villages, directed by teachers who were neither trained in agriculture nor habituated to rural living.

Near Meshed there are a number of villages with schools which are either newly completed or under construction—such as Shagha and Valiabaad. It is contemplated that these will have attached experimental gardens and that a nearby farm will be made available for practical classes in agriculture.

In a few private schools there are vague or restricted practical exercises in agriculture; as, for example, in the Dilmaghani Institute in Kerman, a boarding school which is really an orphanage, where the boys take care of the extensive gardens, orchard, and hothouse.

The best known secondary-level agricultural school was that established at Karaj in conjunction with the Agricultural College at the time when that boarding institution was under the Ministry of Agriculture and not the University of Tehran. When the Agricultural College was made a Faculty of the University in 1324, this secondary school was progressively decommissioned and for the past two years has ceased to exist.

Three years ago, however, the Ministry of Education created a Rural Teachers' Training School in Sari, to supply the demand for rural teachers which previously had been filled by the ordinary teacher training school in Babul, Mazandaran, which now is closed. The Sari School is located in a secondary school building and has a modest experimental garden and machinery shed attached and a small experimental farm about two kilometers distant, where approximately ten hectares are under cultivation.

The school accepts graduates of the first cycle of the secondary school and offers a training course which is a mixture of practical agriculture and the normal teacher training course. The first class of 30 students has been graduated and are now teaching. The students are recruited from the surrounding farms in that area and are provided the usual board and room supplied in all teacher training schools, with the same obligation to work for the Ministry of Education for five years in repayment. The school is headed by a graduate of the Faculty of Agriculture at Karaj and, while the school is still obviously primitive in many of its characteristics, it definitely shows promise of supplying a very real need for rural, agriculturally-trained, elementary school teachers.

The old Agricultural College, now elevated to the position of a Faculty in the University of Tehran, is located at Karaj, 40 kilometers west of Tehran. The buildings are more than adequate, and are owned by the University, though the land on which they are constructed and the adjoining fields of the experimental farm are public domain, for which rental must be paid. The machinery is old and in an advanced stage of disrepair, and is owned by the Ministry of Agriculture and borrowed by the Faculty.

The school has an estimated capacity of 300 students and probably could take many more if a modest increase in the boarding facilities was made, but is currently operating at only about 20 per cent capacity with a total of 65 students in the three classes. The entire annual class of approximately 15 graduates is normally absorbed by the Ministry of Agriculture, and this limited market for the product of the school has made recruitment extremely difficult, despite the fact that boarding and living facilites are provided free of cost.

The instructors seem relatively well trained, and an appreciation of the necessity of practical work is apparent, with half of the day spent in field work, and a total of three months' full-time work in the fields required in the three-year program. There is an annual trip made during the holidays to some typical agricultural area for study of specialized crops. The library, while somewhat out of date, appears to offer a good foundation for the construction of a modern one, and the laboratories are adequate though badly in need of modernization. Some increase in practical work and modernization of equipment should make the Faculty quite effective, even though perhaps not up to the standards of quality of a first-rate American or European school of this type. The basic need, however, is to open up a potential market for trained agriculturalists beyond the extremely limited one of the Ministry of Agriculture's administrative program.

The Faculty of Veterinary Medicine of the University of Tehran is located in three rented buildings in downtown Tehran, with a faculty of sixteen professors and twelve teaching assistants. The laboratory facilities for the various professors are more than adequate, though the laboratories and classrooms for students leave a very great deal to be desired, being nearly non-existent in certain fields of specialization. There are at present only 60 students, 23 of whom are in military service and are being trained for the Army. The annual cost of operating this school is approximately Rls. 3,000,000 under present conditions, but only a part of this should be considered primarily an educational cost, as one-half of the time of the school is devoted to veterinary clinics rather than instruction. The Faculty appears well trained, all but one of the professors having received training in France. The library of 3,800 books is primarily in the French language and is catalogued by author, title, and subject. There appears to be a gross shortage of space for the care of animals under study or treatment.

Night Schools

Night school and adult extension classes constitute the eighth type of school in the Iranian system. These are basically of three types: Government, private, and industrial. With isolated exceptions, all are highly ineffective and are probably a waste of money as now organized. The typical Government night school is designed to be an anti-illiteracy class, concentrating upon the teaching of reading and writing for beginning students and the completion of the standard six-year elementary school program for advanced students. Classes are held in regular elementary schools, frequently without adequate lighting, with official elementary school teachers conducting the classes in return for a small additional stipend, with either the standard elementary school textbooks or the official Ministry of Education anti-illiteracy textbook used for teaching material, and with a floating and completely unorganized student group.

The educational statistics on these classes, which show a total of 1,034 classes with 26,279 students, are unreliable. Classes visited in eight cities indicated that absenteeism ranged from 10 to 90 per cent. Students enter, stay a few nights, and leave. Except in a few large centers there seems to be no continuity of work. Some schools which are supposed to be operating are in fact closed. Children of nine and ten years of age are enrolled in classes with men of forty. The content and the method of teaching is generally poor even for children and is entirely inappropriate for adults.

The Government also conducts anti-illiteracy classes in the military units for conscripts. The Army course follows either the Ministry of Education textbook for adult illiterates or a special Army textbook. There is an approximate conscript strength of 80,000 soldiers, of which the Army estimates 91 per cent enter as illiterates. At present, there are 64,000 conscripts receiving anti-illiteracy training in three to four one-hour classes per week. Approximately 95 per cent of the trainees learn to read in from three to four months. The classes are taught either by military personnel or by teachers supplied by the Ministry of Education.

Industrial night schools and adult extension classes are organized under the administration of the Ministry of Labor under a Council of Ministers' decree dated 22 Tir 1326 (1947) which provides that all factories must provide classes, supply teachers, pay the wages of the illiterate workers during the time they attend, and pay a bonus of 5 per cent of the base pay to all workers who study for one year and obtain a certificate indicating that they are literate.

In practice the small factories, where the highest degree of illiteracy and the worst labor conditions usually exist, simply ignore the order. In the large industries, which are more directly under the surveillance of the Government, the classes are formed, but many are quite perfunctory in their administration. Classes are well taught, well attended, and effectively run only in those factories which require a high degree of skill and where the management is itself sufficiently convinced of the value of a literate labor supply to make educational atttainment a prerequisite for promotion. One of the better schools is that operated by the Shiraz electric power plant. The Anglo-Iranian Oil Company program in the refinery area of Abadan is outstanding.

Among private night school classes, the standard of work is usually rather higher than in Governmental, mainly because the teachers are in general motivated more by a spirit of service than by the economic increment offered for extra work. The classes organized by a philanthropic society known as Bongah-e-Taavona Shahab ("The Shahab Co-operative Corporation"), with 200 members and about 5,000 students in Tehran, Isfahan, Kazvin, Shiraz (temporarily suspended), and Ahwaz, are especially noteworthy examples of what can be done with an extremely modest budget when administered by a socially-conscious and public-spirited group of men, most of whom are school teachers who donate their services in the evenings.

Religious Schools

The two levels of religious schools should be mentioned, although their participation in the educational endeavors of the Seven Year Plan will in all probability be minor. There has survived into modern Iran a system of private religious schools dating from the ancient maktab, or elementary schools, and the madrassah, or higher religious colleges, taught in private homes, in mosques, and occasionally in beautiful schools by the learned men of the Moslem faith, the ulama.

There can be little doubt that most of the elementary teaching provided the children of the villages and of certain highly traditional towns where the official program is inadequate, is supplied by these teachers. They sit on the floor with a little group of youngsters in a circle around them while they teach the Arabic alphabet and the process of reading with century-old methods. It is usually the poorest class that send their children to the teachers in the maktab; yet there is almost invariably a tuition fee charged, which even though small is a serious burden on the family.

Mass Education Media

Mass education media, as a formal educational instrument, are almost entirely limited to a few libraries and museums. The only people who have radios are those who can afford the higher levels of education and do not need low-cost instructional programs. Public motion pictures are a commercial venture and are limited to a very few large cities. Purely educational motion picture equipment is almost non-existent. There are a few private schools, such as Elborz College in Tehran, the Marker Boys' School in Yezd, and the Technical Institute of Abadan, which have their own projection equipment. The Ministry of Education reports ten motion picture projectors in the official schools, but does not itself prepare films nor maintain an imported library.

The public press supplies a limited form of adult education, but on a completely unsystematic and unorganized basis. Public libraries, such as are common in the United States and England, where the average citizen can withdraw a book without charge and read it in his home merely by signing a receipt for its custody, do not exist. In fact, extremely few school libraries will permit such a courtesy to the faculty members, and almost none to the students. Museums exist in Tehran (the National Museum under the Department of Antiquities, and the Ethnographical Museum which exhibits tribal culture), in Isfahan, Shiraz, Meshed (in conjunction with the Shrine of the Eighth Imam), in Ghum (in conjunction with the Shrine), and at various sites of great historical or archeological interest, such as Toos, Shush, and Persepolis.

The School System in General

A schematic diagram of the interlocking of the schools of Iran is presented in Exhibit B-3.

A detailed evaluation of the various elements of this educational system will be presented under later headings. The results of the present school system reveal it to suffer from three serious deficiencies: it eliminates far too high a percentage of the potential school population before that group has the opportunity to secure skills that will make the young men and women economically and socially productive in Iranian society; it teaches a highly formal, theoretical, and relatively non-useful set of skills and body of knowledge, so that those who do graduate are frequently unequipped to compete in the practical life of Iranian society; and it is extremely rigid so that it resists change and fails to meet the demands of local situations. A diagram of the attrition rate of successive school years is presented in Exhibit B-4.

Certain elements of the school system probably preclude any major reform for some years to come because of cost. One of these is a shift in the grouping of the classes in elementary and secondary schools. The 6-3-3-4 system which now exists may or may not be the best for Iran. But whether it is or not, there can probably be no major change from an elementary school of six years, a secondary school of six years, and a university structure above the twelfth class, because the investment in six-grade elementary schools and of five- and six-grade secondary school buildings is too great to be jeopardized by a program shift.

Similarly there are inherent plant deficiencies in the construction of libraries and laboratories which will make the adoption of a system of individualized laboratory experiments—such as is universal in the United States—very costly. Fortunately, the number of schools where such work is necessary is still relatively few in Iran, and these may be modified by the addition of a wing to the present buildings, and by the gradual adoption of a new standardized architectural form in future construction. The libraries of the schools are so completely ineffective and a library in any school system is so essential an element that it would be wise to convert a classroom, even at the expense of extensive program changes, in order to secure space where a modern catalogued and indexed library might be established in every school above the elementary.

Such changes will be of little use, however, if the regulations are not relaxed, the personnel not retrained, and the entire atmosphere of the school changed to permit the use of such equipment once procured.

CURRICULUM

The several curricula used by the schools of Iran may be described quickly because only standardized types exist. Since the kindergarten is not really an official part of the school system, no official program exists and the actual offering in the individual schools varies greatly with the capacity and personality of the director.

All elementary schools in Iran must by law (the Basic Education Law, 9 Aban 1290, Acts II and IV) follow the standard official program, which is given in Exhibit B-5. This applies to girls', boys', and coeducational schools, located in villages, towns, and cities, whether official (under the administration of the Ministry of Education, or the municipality) or non-official (under private ownership). Where economic difficulties or shortage of teachers precludes giving the entire program, as, for example, in villages, it is merely reduced in the number of years offered, with no readjustment of the subject matter or methodology.

The secondary school curricula are equally rigidly prescribed, but are divided into two categories on the basis of the sex of the students. No coeducational secondary schools are permitted to exist. Both of the secondary schools (boys' and girls') are in turn divided into two cycles: the first cycle being for three years and presumed to give general education which may serve either as a terminal cultural course or as a preparatory course for more advanced studies. The second cycle is again divided into two sections: the first two years (that is, the fourth and fifth grades of the secondary school) which are advanced general studies; and, almost exclusively in a very small number of boys' secondary schools, a final or sixth year which offers specialization in one of four curricula—science, mathematics, literature leading to possible admission to the University, and commerce as a terminal course.

The great majority of girls' secondary schools are three years in length, but a triple option is permitted upon completion of that official program: the graduate may enter an exclusively girls' professional course such as the women's teacher training schools; she may continue in the official two-year second cycle of the girls' secondary school; or she may pursue a course which is the presumed equivalent of the boys' second cycle with the exception that feminine subjects such as housekeeping, the care of children, and dressmaking replace the boys' military training—if such a course is available. It is through this latter option, which exists in only a minority of the schools, that the very small percentage of women are prepared who go on to the University.

The official boys' secondary school curricula for the first and second cycles, and for the specialized sixth-year optional course, are given in Exhibit B-6. The two cycles of the girls' secondary school are given in Exhibit B-7.

The curricula for both the men's and women's teacher training schools are prescribed by the Ministry of Education. These schools are also segregated despite the fact that both prepare teachers for precisely the same future work and that the graduates will work together under either male or female directors. The courses are two years in length and follow graduation from the lower cycle of the regular secondary schools. The subjects required in the two schools are almost identical, differing only in that the men receive one hour per week less instruction in hygiene in the second year and substitute farming and handicrafts for home economics and sewing. Since Sari is the only men's teacher training school in the country where agriculture of any nature whatsoever is taught in practice, this difference appears to be rather academic.

The men's schools are almost without exception boarding schools, while the women's are day schools. Yet nowhere in the official program is any effort made to utilize the immensely greater opportunity to prepare the teacher in a complete personality sense which the boarding school organization affords. The official curriculum for the men's teacher training schools is given in Exhibit B-8 and for the women's teacher training school is given in Exhibit B-9.

The curricula for the elementary trade schools, the seven secondary technical schools, and the two higher technical institutes vary from school to school. The Tehran elementary trade school has already been described. The Tehran secondary school (honaristan) curriculum, being typical of this class, is given as an example in Exhibit B-10.

Four Faculties of the University of Tehran have particular importance to the development of the Seven Year Plan. These are the Faculties of Engineering, Sciences, Agriculture, and Veterinary Medicine. Their curricula are fixed by the University Senate upon recommendation of the respective Faculty Council and the Department for the Preparation of Curricula, which is a sub-section of the University Secretariat. These curricula permit very little latitude of choice, once the basic area of specialization has been chosen. The only electives permitted are relatively minor choices, such as that of what foreign language seems most appropriate to the student's program. The four mentioned above are given in Exhibits B-11, B-12, B-13 and B-14, respectively.

The remaining types of schools in the Iranian system do not appear to have a direct relationship to the increase of economic productivity so that no detailed analysis will be made of their curricula.

All of the curricula currently in force are rigid, formal, authoritarian, crowded, and in varying degrees unsuited to modern industrial and agricultural society. They make no allowance whatsoever for variations of needs between individuals, regions, individual schools, or between the fluctuating demands of the labor market. The sons of a Baluchi tribesman, an Abadan engineer, a Mazandaran farmer, and a Tehran deputy must follow exactly the same curriculum. The course, which is probably very inferior for all students, is primarily geared to the economically-favored urban dweller.

All curricula are highly formal, even academic. They are designed to "pour knowledge and information" into the student. A few examples are pertinent. A mechanical engineer is hardly educated if he can describe in detail the mathematical formula for calculating the stress on a beam, but cannot recognize the instruments by which the variables for his formula must be measured. A secondary school student of biology is hardly educated if he can name the bones of the skeleton, the muscles of the body, and describe the functions of the several internal organs, but has never dissected a fish or a frog, and systematically and in ignorance violates the basic rules of hygiene which should be the result of his study. An elementary school child is hardly educated on moral grounds if he can reproduce in sing-song a phonetic rendition of an Arabic religious text, yet neither he nor his teacher know the meaning of a single word.

The result of this formal type of curriculum is an attitude of academic cramming. Each student attempts to memorize the exact text of whatever authority is presented as the accepted version, usually the textbook, and considers that he has successfully mastered the material when he can flawlessly repeat it verbatim, even though he may understand only dimly the implications and even though the "knowledge" has no appreciable influence upon his living. The curricula and their resulting attitude, therefore, are a far cry from the guided growth which is the aim of modern education.

The curricula are by law completely authoritarian. They are handed down from the pinnacle of the educational system by a minute group of the intellectual elite who control the Ministry of Education, and reflect the somewhat narrow experience of this little group. As a result, the Iranian secondary school offers at most four or five choices in specialization. In contrast, the modern secondary school in a decentralized system offers dozens, sometimes hundreds, of separate course combinations in an endeavor to meet the social and vocational needs of the community, the interests and aptitudes of the student, the availability of knowledge and similar factors. Similarly, a large American university may offer thousands of separate, individually-tailored courses designed to fit the students.

The average Iranian curriculum forces all individuals, regardless of their interests, capacities, and personalities, into a common mould. If an unfortunate individual, no matter how gifted in certain ways, fails to attain the minimum requirement in any specific element of the canonized body of knowledge, he is eliminated as unworthy and unsatisfactory. The educational system thus turns into a gigantic sifting device, highly artificial and only slightly related to any real demonstration of ability. This again is in marked contrast to the concept that the individual citizen, no matter what his age, sex, capacities, or interests, has the right to full educational opportunity, and that reasonable order and system may be given the infinite variety of curriculum combinations which is possible under a free elective system, through systematic and intelligent educational guidance.

Existing curricula in the various levels of Iranian schools are overcrowded. This is almost an inevitable result of the "body of knowledge" concept of curriculum construction, and has been found to be impracticable in every nation which has accepted this philosophy. This again is in direct contrast to the modern theory of curricula, which holds that education is a social growth and hence a progressive process which is not terminated by graduation from schools but which will presumably supply the individual with the factual knowledge necessary, throughout his lifetime, to his proper integration into society. It also holds that the acquisition of skills, undeniably a part of the formal educational system, cannot be generalized for society, except possibly in very limited areas, such as literacy and a command of the simple number processes; that the most fundamental elements which must be acquired in the formal educational process are those of proper attitudes and procedures; and that these attitudes and procedures can very largely be taught independently of any canonized subject matter content. This position immediately reduces the burden on the curriculum, since it no longer is a matter of imperative importance whether or not the student crowds into his school eighteen formal courses of study.

Finally, the existing curricula are demonstrably unsuited to modern Iranian life. They have failed to produce a sufficient number of the type of citizens and technicians needed, and they have produced a very large number of discontented, badly-adjusted, unproductive graduates who are unequipped to meet the needs and opportunities of the times.

METHODOLOGY

Integrally linked with the curricula of the schools of Iran is the methodology. There are seven elements of the existing pattern which deserve mention: study and recitation, lectures, library practices, laboratory practices, problem solving, work and practical experience, and examinations.

The most obvious method used in the elementary and secondary schools is a formal study and recitation technique. The children are seated in rows, usually extremely cramped for space. Those who are fortunate enough to have books study each page with unflagging intensity, while their companions look on with them or sit idle. In the lower classes, the quantity of study material is very limited and even the dullest student soon has memorized the lesson. This tradition is encouraged by the formal practice of "copying" the lesson, presumably to give practice in writing.

At the secondary level, the tradition is continued, despite a very marked increase in the amount of material to be studied, partly through habit and partly through fear that the slightest variation from the text will be considered an error. It is not uncommon for a student who finds himself unable to answer some question put to him by the teacher, to beg that he be assisted with "the first line. . . ." Obviously, such parrot-like repetition is no indication of any real command of the subject. Students in the English classes of a number of cities studied were quite unable to name the major nations of the world where English is spoken. Any variation of the phrasing of the question on the part of a visitor frequently evokes an interception of the question by the teacher, who in turn questions the class in the formal, official phraseology.

The students normally stand at rigid attention while reciting. A class is considered "disciplined" and "good" when it springs to its feet at a quasi-military command from the student chosen "leader" or "head-boy"; sits in immobile silence except when an individual is called to recite; and rattles off the required memorized answer to any question which is put to it. It is not infrequent that the answer is recited so fast that even a trained school inspector cannot follow the patter of words. An especially well-disciplined class is one which, to the foreign observer, appears to cringe at authority. There is nothing friendly, relaxed, or inviting in the atmosphere. In two schools in Sari, there were even signs up on the playground forbidding the children to run, shout, or play during their recess period.

Such practices are the complete antitheses of what has been found most effective in modern education, where even the youngest students are encouraged to reason, to argue a point of difference with the teacher on intellectual grounds, to lay out the plan for their own study, and to analyze and criticize their own findings. Discipline is considered good in such a system only when it is concealed, when it is almost entirely self-discipline, and when it is actuated by guidance and reason and not by force.

At the higher levels—upper grades in the secondary school and study in the university—the lecture technique is most common. Lectures have their place in education, and where the teacher-student ratio is very great may be economically necessary. But lecturing has been found to be one of the least effective teaching techniques and one of the easiest for an indifferent teacher to follow. It is based on the theory that the student will "know" when he has been exposed to a given body of knowledge. It amounts to little more than presenting the student with a relatively abbreviated and unprecise oral textbook, which he is compelled to endure through compulsory attendance in class. At the university level, it is not infrequent for the lecture to be precisely that—an unpublished textbook of the professor. Some gifted individuals can add a little to the bare content of their lecture through the inspiration and personality of their presentation. But lecturing should be held to a minimum at all levels and should almost never be used in the lower levels.

In an urban elementary school in Isfahan, for example, the children were drawn up in military files while a formal statement on personal hygiene was read to them by the teacher. It was perfectly obvious that none of them understood the lecture, and could hardly have carried out its injunctions if they had, in view of the three extremely dirty toilets for over three hundred students and no provision for washing except a stagnant pool.

The library practices of Iran are probably the most inadequate of all the teaching techniques employed. The books are not purchased systematically and the libraries are usually heavily loaded with obsolete and worthless official journals and private gifts. There is probably not a single scientifically catalogued and indexed library in Iran—the five that appear to come closest to it being those of the University (and especially the Higher Teachers College which uses the Dewey Duodecimal system), the Technical Institute in Abadan, the Elborz College, The National Library, and the Library of the National Archeological Museum.

The libraries which are primarily working libraries, those of the elementary, secondary, teacher training, and secondary level technical schools, are of little or no use as they now stand and are virtually unused. For a library to be of any value as a teaching instrument it must contain the required knowledge, be arranged so that the student can find that knowledge, and be administered so that he can have access to that knowledge after he has located it. The libraries of Iran fail in all these respects. A sum equal to ten per cent of past expenditures on books, spent intelligently by a trained librarian, could easily develop a minimum required body of knowledge for the average library.

To be of practical use, even the smallest library must systematically catalogue its books and maintain a subject-title-author index. This is a technical matter, and the development of a system for doing it thoroughly and accurately is a highly scientific professional task. Unfortunately, the task is very much under-rated with the result that the libraries of Iran are almost without exception catalogued by untrained personnel in a haphazard manner. The book is inventoried at the time of its purchase or acquisition, and, in a few cases, a simple author-title index is prepared. The all-important subject-matter index is almost universally ignored.

Once catalogued, the books are locked up because the librarian is legal custodian of them and his future professional career depends upon being able to account for each and every one of them. This system, based upon suspicion rather than desire to spread learning, results in only the most limited use of books by the most intellectually enterprising students, and, therefore, tends to defeat the basic purpose of the library. In some larger schools, a separate room is reserved for the library, where the students may consult the books without withdrawing them. In smaller schools, the books are usually locked in a cabinet in either the teacher's room or the director's office. In both cases, the probability of the student actually using the books is reduced to a minimum.

These practices again are in direct opposition to modern educational methods. The American schools, for example, use every psychological device possible—comfortable reading rooms, book exhibits, instruction in all classes on how to use the facilities of the library, frequent assignments by the teacher that require "finding" knowledge—to increase the circulation of the books. A simple receipt technique provides all the custodial security that is necessary. A small percentage of the budget each year is set aside for replacement of books that are lost or destroyed, and these are considered an expendable item.

The laboratory practices of Iran are almost as inadequate as are those of the libraries. The same custodial attitude is predominant in the selection and care of laboratory equipment. The laboratory is all too frequently a mixture of a museum of scientific apparatus and a stockroom of equipment for the instructor to use in his infrequent demonstrations. The idea that the laboratory is a working classroom, in which every student should experience every experiment in exactly the same way that he reads his textbook and participates in the classroom procedures, is still foreign to Iran—a shortcoming for which the plea of restricted budget is an unsatisfactory explanation in view of the very few laboratories which are ever used to anything remotely approaching their capacity.

In one laboratory after another which had equipment that was quite adequate to a very good secondary school course in physics or chemistry, the proof of its disuse was obvious: the absence of wires for electrical connections and rubber tubing; the dust in the retorts; the manufacturers' labels still pasted on the test-tubes; the chemical containers with the ground-glass stoppers permanently sealed by natural annealing; the optical equipment locked up and the key lost; and the lack of knowledge of simple laboratory techniques revealed by many instructors.

Where equipped laboratories exist, the equipment chosen frequently reveals an academic and theoretical choice rather than a practical one. Thus Iran has spent large amounts of foreign exchange in the purchase of equipment which could have been made out of simple salvage apparatus for the study of matters such as parallelogram of forces, torque, falling bodies, friction, simple harmonic motion, together with racks, stands, and plane-tables, to mention only a few. Much of the equipment is badly out of date, as evidenced by the very high predominance of static electricity equipment which serves no useful end today.

The most striking deficiency of the laboratory practice, however, is the lack of laboratory or experimental-mindedness on the part of the instructors. A very large number of fundamental scientific experiments can be performed with equipment which can be found in the humblest home. Thus, where there is a kanat available any man with a watch can perform a falling body experiment. Any place where a bit of snow falls or there is ice formed on a puddle, a man with a balance and a thermometer can perform a latent heat of fusion experiment. Three or four pieces of iron, a bit of wood, and some insulated wire will make an electric motor, or even, with skill, a galvanometer. A bicycle leaning against the school building will provide nearly every geometry lesson taught, will illustrate dozens of fundamental physics experiments—from structural stressing, friction, mechanical advantage and efficiency in basic machines, to complicated problems in velocity and acceleration. But so long as the mental attitude of both students and instructors is non-experimental, no amount of laboratory equipment or budget will solve the problem.

In one secondary school after another the students admitted that they had never dissected an animal, taken a temperature, mixed a standard acid solution, performed a parallelogram of forces experiment, or seen an I or an H beam, even though the resources with which to do so are present nearly everywhere. Yet many of these students could present a theoretical discussion of relatively complicated scientific experiments.

Problem solving as a teaching method in Iran is restricted almost exclusively to the mathematical solution of simple scientific problems of a relatively formal nature. It is not used in social studies. In more advanced educational systems the great social and political issues of the day are recognized as vital elements in a student's life, just as they will later be in his life as an adult. He and his classmates are encouraged to try to detect what is the basic problem involved; to gather pertinent material from all sources (libraries, interviews, newspapers, radio commentators, actual experiments where practicable); to appraise in a critical manner the information he has collected (from the point of view of bias, propaganda quality, special interests and inaccuracy of fact); and finally to develop a logical solution which he can defend before his classmates. This technique begins in the first grade, when children make models of houses and villages in the sandpile, and it continues through the highest level of the post-graduate work in the university, when the doctoral candidate discovers and defends his solution to some problem.

This fundamentally different viewpoint cannot be over-emphasized. The existing Iranian methodology is designed to train people who uncritically accept the dicta of those above them, whereas the modern methodology aims at creating a self-directing, self-thinking, critical individual who bases his actions on reason, not on authority.

Closely akin to this methodology is that of work and practical experience. In this also Iran is very lacking. Nowhere in the elementary or secondary schools is there apparent any systematic effort to teach the child through doing, as opposed to talking about doing. The situation with regard to laboratories has already been discussed. In the various levels of technical schools some effort has been made to remedy this defect and in certain private boarding schools and orphanages there is a real attempt to teach the student through a systematic program of work.

In almost all of these instances, however, the practical experience is limited to vocational skills, and the extension of the technique to other areas of learning is overlooked. Thus, for example, in even the most modest school it would be possible to organize a student self-government association which would teach the students how a representative government works—with elections, student assemblies, student courts, monitors to maintain discipline, student-financed school improvement projects, and organized charities, while the students actually took over the burden of governing themselves. It is a little unrealistic to think that a student upon graduation shall exercise his prerogatives as a citizen intelligently if he has been accustomed during his entire formative life to be a passive object of teacher-imposed authority and discipline.

There are a few Iranian schools which have made a modest beginning through the establishment of a student "newspaper", usually a hand-lettered item which is posted weekly on the bulletin board. Some schools have sports associations and dramatic clubs which approximate similar extra-curricular activities in an American school. All such opportunities for self-direction, exploration of interests, and practice through actual work, should be encouraged. The common form of student participation, that of a "head-boy" appointed by the teacher, or of teacher-dominated monitors who are used to herd the smaller children into compliance with the school's rules, however, should not be encouraged.

Examinations are popularly considered instruments for determining academic attainment in Iran. They are actually highly artificial barriers for the purpose of weeding out those considered unfit for further training under the existing system. But examinations are, and should be, much more than these two things. They are in themselves a teaching and guidance methodology. Thus, for example, regardless of what may officially be advanced as the curriculum of a school, it is in a large measure the demands of the graduation examination, or of the entrance examination to the next level of schooling, which determines what will actually be the curriculum taught and studied. What the examinations ask, and the manner in which they are conducted, are major teaching devices. There is probably no lesson learned quite so thoroughly as that of the points which a student found he could not answer in an examination.

The present examinations given in Iran seem to be based upon the assumption that every student must be potentially dishonest. An elaborate mechanism is followed which is supposed to ensure that a teacher himself does not learn ahead of time what questions will be asked of the student, so that he may improperly prepare his class for the test; the student is seated in a pattern designed to make it difficult for him to cheat; the examination is carefully monitored; and the unfortunate child who dares to look at his fellow student's work or to consult a book is treated severely. While it is immediately granted that violation of the moral code not to cheat is a real delinquency, it still seems a little severe to establish the convention that it also is morally wrong to do exactly the thing which in later life the student will be expected to do, seek expert advice from the best source available. If the student had a voice in establishing the convention, if he were on his "honor" not to get help, the case would be much clearer.

The whole question of examinations is so complex and has caused so much unnecessary waste and heartbreak in all nations of the world that a very extended international study was conducted of educational practices by the Carnegie Corporation of New York about a decade ago, with only indifferent results. The practice is growing in the United States of constructing examinations in the nature of projects which are held within certain limitations of subject and time, with completely free access to all sources of information.

Whatever is the ultimate answer, Iranian educators would do well to recognize certain examination axioms which have been demonstrated repeatedly by controlled experiments. The most brilliant person can be confounded by questions of answerable fact put by a person of much less ability. Any student can be passed or failed by adjusting the questions asked, the marking scale, or the severity of judgment. With the possible exception of statistically standardized tests of the so-called "objective" type, which have never been used in Iran and which are expensive and difficult to prepare and standardize, it is an accepted fact that no group of individuals will either make out questions of equal difficulty, or grade the same group of questions with equal severity at different times.

There are two methods which the Iranian schools have used quite effectively: the dramatic presentation and field trips or visits to areas of student interest. Iranians are born dramatists and some of the student productions seen during the course of this study were of first quality. This natural ability should be encouraged and developed. All of the social studies are excellent material for this technique of teaching. As far as field trips are concerned, they appear to be well organized, to be accompanied and explained by teachers competent in the subject matter area, and presumably are followed up by discussion and review after return to the school. The teacher training schools, the technical schools, and the agricultural schools, all make use of this technique. One caution should, however, be advanced—"looking is fine, but watching is not the same as doing".

In summary, the methodology follows the curriculum in that it is formal, authoritarian, verbal rather than practical and unimaginative. It is ill-designed for any task but that of giving command of the fundamental processes and even here, if the illiteracy ratio is a partial guide, it must be rated as definitely inferior.

TEXTBOOKS AND TEACHING MATERIALS

Two systems of textbook preparation have been tried in Iran: preparation by the Ministry of Education, or official sanction of privately-produced textbooks, and the free production of textbooks by private authors and publishers. Iranian educators are almost unanimous in their decision that, of the two methods, that of official preparation has proven best. They base this decision on the grounds that when a free textbook market was permitted two things happened: local areas had the resources neither of authorship nor of printing to accomplish acceptable local publication, and dishonest collusion between authors or publishers and the educational authorities resulted in the adoption of some texts which were unquestionably very inferior.

These criticisms are undoubtedly accurate, but so long as the basic philosophy of education in Iran demands conformity with an imposed standard issued by the central Ministry of Education, and hence a standard and uniform curriculum, one should not expect the best authorship of textbooks to be found in outlying areas. If this philosophy should be changed, however, and local modifications in curricula encouraged, it is quite possible that the best authority on the oil industry might be found in Khuzistan, the best on caviar production in Pahlevi, and the best on the carpet industry in Kerman.

The problem of discouraging economic collusion between author and educational official is a condition not limited to Iran. However, it is relatively difficult to control so long as the local citizens have no control over the appointment of the educational director. In the United States, where the educational authorities are locally appointed, such a demonstration of bad faith would be immediately apparent and susceptible of correction. Certainly, whichever of the two systems is ultimately adopted by Iran, there will be necessary a very great deal of fundamental work on the preparation of textbooks.

The textbooks in the elementary and secondary schools suffer from the psychological defects which are inherent in the present system in that they are formal, authoritarian, and highly academic. They present, with varying degrees of success, a body of factual knowledge, and a systematization or interpretation which reflects the individual author's interests. No real effort is apparent to discover either the appropriate psychological level of the student audience, or to encourage the development of intellectual interest.

A detailed criticism is beyond the range of this report and would require a detailed analytical study of major proportions. However, a few examples will illustrate the general criticism. Foreign language textbooks, and specifically English, are without exception unsuitable. They are not based on a scientific word-count of the language that is being studied. Their selection of material is poor both from the point of view of illustrating the life in the English-speaking nations, and from the point of view of drawing upon the experiences of the Iranian students. Textbooks on moral teachings are, of course, above criticism as to content. However, certain of them appear to fail in accomplishing the purpose for which they are intended, since the students, and the vast majority of the teachers, cannot understand any of the text. Several years ago textbooks containing a side-by-side Arabic and Persian translation of certain great moral quotations from the

Koran were officially used in the schools. The meanings of the more difficult words were explained in footnotes. The educational advantages of some such form of textbook seem obvious. It should be noted, however, that in the opinion of some there is value in the simple repetition of Divine Writings regardless of whether or not the student understands the passage.

The elementary school textbooks on reading are inferior. They are not based upon a scientific analysis of Persian syntax or vocabulary; they do not present sufficient material to give adequate practice in reading; they ignore some of the impressive teaching devices worked out for the rapid instruction of children and adult illiterates; and are deficient as to subject matter and inappropriate to the needs of children in many sections of the country.

The textbook problem in the higher classes of the secondary school, in the teacher training schools, technical institutes, and the university is a very complex and difficult one to solve. It is based on at least three major and possibly inherent deficiencies in Iranian society. The first is the language. Farsi is a language of a great poetic literature. It is not, however, a language of a great scientific literature. As a result, there does not exist a technical vocabulary sufficient to handle even fairly simple modern scientific and technical writings. Either the borrowed word must be phonetically rendered in the Persian (or modified Arabic) script, or it must be written into the body of the text in its original form; a process which, because of the different alphabets, introduces a mechanical difficulty. A third alternative, that of coining new Persian technical terms, is hardly feasible, since there are probably more than 200,000 stabilized technical terms in English which would have to be rendered and since the stabilization by definition of a technical term is a very lengthy and difficult job.

The second deficiency is that there does not exist in Farsi any fundamental scientific literature upon which textbooks could be based. This results in a perpetual lag behind the scientific discoveries and writings of other nations which have world, rather than localized, languages. An example from the Tehran Technical School is pertinent. Its curriculum is still tied to a German technical literature which is ten years out of date. The obvious industrial handicap of such outdated instruction need not be further emphasized. In this particular instance there is little excuse for not shifting to more up-to-date material.

The third deficiency is that of economic handicap. It would seem quite possible and desirable to create a continuing supply of good translations of foreign textbooks. Such a solution probably is the desirable one in the lower or more generalized areas of middle and higher education. But in the higher levels and specialized fields it is probably economically impossible. It costs almost as much in time and money to translate a book as to write it. The translation imposes all of the language handicaps that pertain to original authorship. Iran can have only a very limited market for such books, as Afghanistan and a minority group in India are the only other nations which might purchase material in Farsi. The situation is quite different from that of Argentina (15,000,000) and Chile (5,000,000) which publish an enormous literature of translations into Spanish. They have a market of approximately 110,000,000 Spanish-reading people to support their venture.

The only practical solution for the foreseeable future seems to be that of standardizing upon one major European language which will become the second or working language for all those who aspire to rise above the secondary level of education. In the long run it will be cheaper and far more effective to train this limited group in a foreign language, than to attempt to reproduce the enormous literature that other nations, with a more universally spoken language, have created. The choice of what that language should be is a matter for Iranians to decide. However, for scientific purposes English appears to be the choice. With regard to cultural, it might be a desirable solution to consider Farsi the cultural language of Iran. One thing is certain: Iran can never solve this troublesome educational problem as long as it attempts to spread itself impartially over too wide a linguistic area. A considerable proportion of the population of Iran has two native languages, Farsi and the regional dialect. To expect these students to acquire two or more European languages with which to study is to impose an impossible and unnecessary educational handicap.

TEACHERS

Iranian educators and lay people are almost unanimous in their condemnation of the teaching profession, upon which they place the major blame for the failure of the educational system. The foreign observer is impelled to be more charitable. It is obvious that the vast majority of teachers are not up to the standards of major western educational systems, but they can hardly be expected to be. They are the products of their social environment, of their own imperfect training, of an almost complete absence of incentives toward continued professional growth, of a complete lack of provision for in-service training, and of an economic and social status that is looked down upon by the more able members of the intellectual elite. The result is that superior individuals are discouraged from entering the teaching profession. In spite of this, there are a large number of very able people in the teaching profession of Iran. Probably the majority would be highly acceptable if given any reasonable chance to develop professionally.

As might be expected, the shortcomings of the teaching group largely reflect the deficiencies of the educational system in which they were trained. They tend to be authoritarian and, with the exception of a few gifted men at the highest levels of the educational system, emphasize the repetitive. These qualities have been discussed previously, so that no further comment is needed here.

Salaries are too low to attract any large number of qualified personnel who can devote their full energies to teaching. In this connection, Iran would be wise to review carefully the situation, and take steps to increase salaries to a point where serious, able and devoted people will be attracted to this most important of professions. The present salary scale is given in **Exhibit B-15.**

Practically all teachers are full-time employees at the elementary level. Above that level, very few work full-time in any one school. There are three reasons for this. Since the subject matter content is considered the most important part of the schooling process, it naturally follows that the teacher of a specialty, even in the lower years of the secondary school, should himself be a specialist. Thus, it is the custom to have a single chemistry or physics teacher circulate among the schools of a city, teaching an hour or two per week in each of several institutions.

A second reason for part-time teaching is that the salary paid in many parts of the educational system is so low that the teacher must find extra employment elsewhere.

This has led to the growth of an attitude which would be considered entirely unacceptable in the United States, namely, that the teacher be paid for the classes he teaches, and that when he leaves the classroom his responsibility is over. In contrast, an American teacher is expected to conduct supervised study, work with student extra-curricular groups, conduct the all-important guidance program, and put in many hours of careful preparation for the classroom work.

As a result of this attitude there has grown up a system of similar part-time teaching by graded teachers, those with civil service status, who receive pay that is the equivalent of other Government employees and hence is presumably sufficient to live on. Because of this, the number of teachers in secondary and higher schools has risen with consequent increase in the per capita cost, and the quality of instruction has dropped off because teaching has been relegated to a side interest of many teachers and professors.

The technical qualifications of many teachers are also inadequate. A teacher in an elementary school who has himself only a six-year elementary education cannot very well be expected to offer leadership to his students, nor to practice the more skillful teaching techniques which are common in more advanced nations. There is little excuse for the level of technical incompetency which is found among secondary and some higher educational institutions. A chemistry professor who does not even know how to hold the stopper while pouring acid into a test tube, a mechanical drawing professor who does not even know the proper use of a T-square and triangle in drafting, a biology instructor who has himself never dissected an animal, a teacher in a technical school who permits his students to file without handles and sharpen tools on a cracked abrasive grinder, an instructor in a higher technical school who welds without goggles, and a professor in a Faculty who permits power equipment to be used without safety guards, can only be considered to be technically incompetent.

The most serious shortcoming apparent throughout the educational system's teaching staff is intellectual blindness and lack of creative self-direction. If a visitor questions the students about any of the implications of the work being studied it is not uncommon to have the teacher protest that that is not a part of the teaching material. The idea that one might go beyond the bare skeleton of the official text and try to make the material something living and real to his students does not seem to occur to the majority of teachers. Withdrawal records of school libraries in the overwhelming majority of schools indicate that the teachers seldom make any attempt to increase their own background knowledge. They stick to the text and repeat what they learned themselves as students.

Occasionally there will be encountered an individual who has risen above his environment. It is upon such men that any real educational reform of the country must be based. Such was a science instructor in a private school in Shiraz who, when he needed to teach the experiment of electrolysis of water, created his own apparatus with a piece of board, two bits of wire, a pair of empty medicine bottles, and a battery borrowed temporarily from some car.

STUDENTS

The students of Iran are what might be predicted from the characteristics of the educational system. Brevity demands a far too great over-simplification, but with this important reservation the various age and specialization groups may be described as follows.

The kindergarten children are the brightest spot in the picture, largely because they have not yet been spoiled by the system. They are natural children who play freely and react in a spontaneous way. The elementary school children, with few exceptions, are frightened and respond to the demands of the teacher like automatons. Not infrequently they are so terrified of the authority of the teacher and school directors that they tremble when they are called upon to recite. Almost without exception they are completely unnatural while in the school, even reciting in a tone of voice which is obviously not their natural one. Only when released for recess time or when they leave school do they appear at ease and well adjusted.

The secondary school students progressively move from this stage of obvious fright to that of rather pathetic verbal sponges who uncritically soak up information authoritatively given them. In their latter years of schooling they feel that they are "too well educated" to stoop to common manual labor, yet realize that they are not really prepared to compete in the realities of everyday life. Their knowledge has been absorbed in a highly academic manner, and they are equipped to carry on a somewhat superficial conversation on a large number of profound subjects, but cannot actually do anything which commands a living wage in the labor market of Iran. As a result they either move into teaching, exert every influence to get some minor position in a Government office, or go on to higher education.

The university students are too complex to be easily classified. It is popular among the older intellectual class of Iranians to dismiss them with the accusation that they are impractical, pseudo-intellectual, theoretical, rebellious, and without any real faith in anything. But this sweeping denunciation seems a little unfair as viewed by the foreign observer. Many of them are quite thoroughly trained on a theoretical basis, and make excellent professional men after a period of practical seasoning on the job. If they chafe at the restraints of the past or if their skepticism temporarily overshadows their faith, these after all are only the universal attributes of youth. If any single criticism can be justifiably leveled against the university students it probably is that they have a far too exalted idea of their own capabilities and economic value.

They are hardly to blame for this opinion, because the Iranian theory is that university education is primarily professional, that only a limited number should be trained to fill the available positions, and that anyone who does not go on to those positions is socially and economically inferior. This theory is in direct contrast to that of the Anglo-Saxon world where in practice a recent university graduate usually must accept an inferior lower-paid position at the outset and can do so without any social loss.

The two general classes of students who continue their education, but not in the straightforward march up the educational ladder to the university, do so largely for economic reasons. The young man who enters a teacher training school almost invariably does so because the free board and room makes further education possible; but he considers that his social position makes such manual labor as waiting on the table, cleaning the buildings, and working in the garden inappropriate. The young man who enters a technical training school almost invariably does so because he cannot either pass the entrance examinations or finance the continuance of a university course.

Although these students know that they will ultimately earn their living primarily with their manual skills, there still lingers a considerable feeling of the stigma of ordinary work. Thus, in one of the best-run technical schools there was a student strike because they felt that it was the "work of servants" to clean up their work benches and shops after study. Such an obviously important profession as agronomist cannot attract students to the Faculty of Agriculture, despite the incentive of free board and room, in a very large measure because its program is associated with the practical work of a farmer in the fields. It is a major tragedy that there exists everywhere among the students of Iran a feeling of contempt for physical work.

Exhibits B-16 and B-17 present statistics of the national population and of the student and teacher populations of Iran.

GUIDANCE

One of the most serious lacks of the existing Iranian educational system is that of a systematic, modern guidance program. At present there exist only the roughest sort of unsystematic and largely unconscious program. A few of the private schools have a tradition of counselling the students on personal problems. Some of the large industrial firms maintain recruitment staffs which travel around the country each year interviewing prospective candidates for jobs and explaining to the students something of the professional or trade requirements for positions in their industries. But in general the process of educational guidance is almost completely unknown.

A full guidance program has an almost limitless number of objectives, but in practice two are paramount: informing students about employment possibilities, so that their interest is awakened and they are guided into positions for which they are fitted by temperament and ability; and correcting student difficulties, primarily in social orientation, so that a high percentage of potentially good material which otherwise might be rejected and wasted is in fact salvaged.

The direct application of these two guidance objectives to the Iranian educational problem is clearly evident. Had a well-developed guidance program been inaugurated in the past, there would in all probability have been far less criticism leveled against students as social malcontents.

The unfortunate attitude of many Iranian educators, undoubtedly dictated through unfamiliarity with the process, may be illustrated by the position taken by an administrator in one of the leading technical schools. He had been complaining about the inability of the graduates to find work. When asked if he or his staff had made a systematic analysis of the personnel needs of local industry and the job requirements for those positions so that he could reform his own educational offerings, he replied that he had not. His position was that when sufficient students wanted to enroll in courses different from those now offered, the school would consider reforming its curriculum. He held that the students knew what job possibilities existed and would naturally seek training which prepared them for positions in short supply. The impracticability of asking fourteen-year-old boys to plan their technical training in terms of a probable labor market six years hence received tacit confirmation in the rapid decline of the school.

A modern guidance program makes use of at least six basic techniques, all of which are applicable to the Iranian school system even in its present situation: observation and rating, daily schedules and autobiographies, psychological testing, interviewing, developmental records, and case studies. At present the Iranian schools use only crude methods of classroom records and essay type examinations to secure the information needed in the first of these methods. There does exist a kind of developmental record in the legal dossier kept for each student. The purpose of these records is to determine whether the student has complied with scholastic requirements and shall be permitted to continue his education; it is not to gather evidence which may be used to help the student who otherwise might be badly adjusted and unnecessarily lost from the system. Therefore, the dossier is almost useless for guidance purposes.

SUPERVISION

The position of a supervisor in the Iranian system is that of a legal inspector who determines whether or not the local educational system has satisfactorily complied with the laws and educational regulations. He inspects and reports. His visits to a school are events to be endured in fear and silence, with the hope that he will find nothing serious to report which is derogatory to the teachers or local administration. In contrast, a modern supervisor frequently works in the schools, assists in demonstration classes, participates in group discussions with the teachers on methods for improving instruction, and makes notes of evident shortcomings only when absolutely necessary. Even in making his notes an American supervisor, for example, jots them down from memory after leaving the school, so that the spirit of friendliness and co-operation will not be undermined by his open recording of failures.

The difference in results is apparent. Under the current Iranian system teachers fear the periodic inspections and will do everything in their power to present an appearance of what they interpret to be the inspector's wish. Dozens of examples could be quoted from the experience of this study alone, but a few will suffice. The equipment in the laboratories is inventoried, carried on the books as a capital investment and not as expendable items, and the laboratory teacher is personally accountable for the complete inventory. He dares not meet an official inspection without a full list of the equipment he is charged with. If he conducts laboratory classes, the students will inevitably break some of the retorts, test tubes, and other fragile equipment. Hence he is under enormous pressure to prohibit the students using the equipment rather than to encourage them to use it, and hence completely negates the very purpose for which the laboratory was established. The supervisor, instead of improving the program, has effectively ruined the program and put the equipment as completely out of use as if it were destroyed. The libraries have also been largely ruined, rather than aided, by inspection.

The teachers and administrators are under great temptation to practice deceit. In the classes, many teachers will attempt surreptitiously to turn back to a lesson which has long since been thoroughly prepared, will call upon the brighter students, or will shift to some teacher-directed activity such as explanation of a lengthy theorem or experiment. The director not infrequently will have managed to get a portion of the school especially cleaned up, or will send the custodians scurrying to clean the toilets, tidy up the infrequently-used laboratories and library, or water down the hallways so that the dust will not rise, while the inspector is delayed with a display of hospitality in the director's office. While such obvious attempts to distort the picture will not deceive even the most inept supervisor, they are evidence of a psychology which cannot help but render great disservice to educational progress.

LAWS

The schools of Iran are authorized and function in compliance with a set of laws and regulations which are compiled in a volume entitled, Salnameh Va Amar-e Vezarat-e Farhangee (The Administrative Laws and Regulations of the Ministry of Education). Because the legal structure of Iran is based upon statutory law rather than common law (a body of legal precedent created by superior court decisions), the educational legal structure is primarily a code with official interpretations. The fundamental law in the code is the Basic Educational Law, 9 Aban 1290, upon which all other laws and all Ministry of Education regulations must depend. While the individual details of the several laws may not be ideal, the legal structure as a whole appears to have been adequate for the currently existing system. However, if the educational philosophy and system are to be fundamentally changed, then the entire legal structure of the schools must be carefully reviewed and major changes incorporated. The legal changes will be relatively easy to write. The philosophical changes will require far greater effort.

FINANCES

The educational finances of Iran come from four major sources: a federal budget, primarily through the Ministry of Education, and to a much lesser degree through other Ministries which maintain educational activities; local municipal taxes which are authorized to secure educational revenues; the income of Pious Foundations; and from private funds such as factories, land owners, religious missions, philanthropic endowments, and private investments.

The educational budget of the national Government is probably too small a proportion of the national budget. The Ministry of Education has normally received about seven per cent, although there are certain hidden additions, such as the salary increments to graded Government workers. The formation of a national budget is sometimes delayed or rejected by the Majless with the result that the Government finances, including the educational budget, run along on an uncertain de facto allocation. Moreover, the purpose of the budget of the Ministry of Education is that of providing the base for education, not that of offering incentives to local endeavors and providing an equalization fund for economically-depressed areas. The budget of the Ministry of Education is given in Exhibit B-18. The distribution of the local grants to education by the Ministry of Education is given in Exhibit B-19.

Following the passing of the Obligatory and Free Education Law, 6 Mordad 1322, which contains a note in Article VIII to the effect that municipalities are bound to co-operate in providing schools and in developing education, there has grown up a system of local taxes authorized by a provision in the "Law for the Establishment of Town Councils". Each of the municipalities is authorized to recommend to the Ministry of Education certain local taxes which, after ratification by the Ministry of Education, may be enforced. The income from these taxes, collected locally, may be expended locally for educational purposes. Almost without exception in those areas which show a progressive educational spirit and a marked construction program, as, for example, Ahwaz, Birjand, Meshed and Nishabur, a major part of the building is being done on revenue from such local taxes.

These taxes seem to suffer from being too diversified and fragmentary, but until the system of direct taxation is reformed as outlined in the section on legal matters (Vol. V), it is apparent that only by such a program could there be collected sufficient revenue.

A more serious question is raised, however, by the fact that these are mainly indirect taxes, which are basically a burden on the consumer and hence on the low income brackets. A table of the existing local taxes earmarked for educational purposes is given in Exhibit B-20.

The third source of income for the educational system is from Pious Foundations. The Pious Foundations are characteristic of Islamic cultures, Iran in particular, and should not be confused either with religious mission organizations or with philanthropic trust funds found in Europe, England, and the United States. There are two basic types: public and private. The public Pious Foundations are established for the purpose of aiding certain philanthropic endeavors defined in law, of which education is a widely-accepted charity. The private Pious Foundations are merely trust funds for descendants of the donor, and have no bearing on this study.

The public Pious Foundations are institutions based on two laws, religious and secular, but the secular law is little more than a recapitulation of the religious commandments. Because of this the overwhelming majority of Iranians would probably resist any attempt to change the law or to alter the application of incomes expressed by the donors. Such public Pious Foundations are, of course, tax-free.

Pious Foundations are divided legally into two classes: those in which the trustee is named by the donor, in which case the administration must be by this trustee; and those in which a trustee is not assigned or the trustee who is assigned is dead without a legal successor, in which case the Government has granted itself the power to administer the foundation. The Government thus receives income from two sources: a small fee or tax on the Pious Foundations of the first type which are administered by an assigned trustee or his legal successor, usually in the amount of five per cent, except for schools and hospitals which are two per cent of the annual income; and ten per cent of the total income from Pious Foundations of the second type which the Government itself administers.

The religious and secular laws regarding these Foundations permit the assignment of trusteeship in perpetuity, usually by the donor mentioning the trustee and the order of his successors who are frequently descendants of the donor himself. Thus, the only way in which this succession can be broken without violation of the sacred religious commandments is for the legally-assigned succession of trustees to be interrupted. Most Government-administered Pious Foundations are very old ones in which the pretenders to legal trusteeship cannot prove their right.

As a source of educational revenue the Foundations present a perplexing problem. There has recently been apparent a disinclination on the part of wealthy people to establish these Foundations, and there appears to be some ground for the belief that this is due to a fear that the Government will intervene in their administration. There is also apparent a trend on the part of private trustees to divert the incomes from their Pious Foundations from educational and public health activities to ones of a more direct religious character. Both of these trends will unquestionably lessen the gross income for education in the future. It is the opinion of competent Iranian legal advisors that the income to the Government for educational purposes can be increased by only two methods: by a thorough administrative reform in Government offices to reduce possible collusion between the private trustees and the Government collectors which, it is alleged, has cut the Government revenues to about 10 per cent of their potential amount; and by an increase in the percentage of income, possibly raised to 15 per cent, which is paid the Government as a tax by private trustee-administered Foundations.

Insofar as we have been able to determine, the income to the Ministry of Education from Pious Foundations for the year 1327 approximated Rls. 3,000,000.

The fourth source of educational funds is from individuals and private organizations. Industry is required by law to provide anti-illiteracy classes for those of its workmen who cannot read or write. These classes are of dubious value, partly because they are conducted in a desultory and perfunctory manner and partly because the wording of the law is not precise as to what actually constitutes an industry. Thus, the majority of small factories of the nation merely ignore the law.

Some major industries contribute to the educational revenue of the nation by providing their own training program. The Anglo-Iranian Oil Company's program in Abadan has already been mentioned. Its annual budget is approximately the same as the annual budget for education in the Seven Year Plan, and, because of the extremely high attrition or wastage rate, this cannot be considered a simple operational expense. That company, and presumably some others, is actually training not alone for its own needs but to supply indirectly the labor market of the nation.

Landowners are also obligated under the law to contribute to the cost of education, but this has proven to be a very indifferent source. In relatively small villages it is usually possible to determine accurately who is the landowner, and hence fix responsibility for compliance with this law. In large villages, where there exists a complicated land ownership, it is frequently difficult for the Government to fix this responsibility, with the result that the income is least where the educational need is greatest.

Fortunately, some of the more enlightened landowners are now convinced that it is to their own best interests as well as their social duty to supply education and public health services to their villagers. Two examples illustrate this point.

A wealthy family of Fars has adopted the fixed policy of setting aside one-sixth of its income from agricultural holdings each year to be spent on education and public health for the villagers working those holdings. In the words of one of the members of that family, a Deputy in the Majless, this was dictated by two reasons: experience in a village producing date palms indicated that production rose much faster than the expenses offered as incentives; and "if we don't do something for these people who work our lands we will soon have no lands to work". This family has completed five schools and has sixteen planned or under construction for the next academic year.

The Shrine of the Eighth Imam in Meshed is the recipient of the income from a Pious Foundation which has approximately five hundred villages under its administration. The trustee of this Pious Foundation has adopted a policy that all future renters of these villages (the program is not retroactive) shall have it made a condition of contract that they build an elementary school according to designs supplied by the local office of education. Nine of these renters so far have agreed to this stipulation.

An important source of educational funds from private donors in the past was that of religious mission schools. The first of these schools was founded by the American Presbyterian Board of Foreign Missions in Rezaiyeh in 1836 and by 1940, when all foreign-administered schools were closed or absorbed by the Iranian Government, there were

American, English, French, German, Russian, and Indian schools in all parts of the country.

There recently have been some tentative efforts made by officials of the Government to determine whether or not foreign schools completely divorced from political and religious inspiration might not be again permitted to operate, and foreign educators be invited to settle in Iran.

It is difficult to appraise the expenditure of the educational funds of Iran except in the most general terms. This difficulty results from two causes: the allocation of available monies has been based on a completely different set of values from that which is being used as the criterion for this evaluation; and the accounting methods which have been employed, while presumably accurate, do not permit cost analysis except after a degree of research which the time requirements of this study do not permit. As an illustration of this latter point, the cost of administration of the Ministry of Education is so intermingled with other costs, through the practice of paying over half of the 600 employees in the Ministry as teachers, that their salaries appear as an instructional expense item and the administrative percentage of the total budget of the Ministry, Rls. 628,801,200 in 1327, cannot be determined. The administrative cost is, however, unquestionably excessive.

A second illustration of the difficulty in securing accurate financial records may be given by an analysis of instructional costs and plant investments supplied by the Ministry of Education. It is officially estimated, though it is emphasized that these are the merest approximations, that the elementary school program on a nationwide basis costs Rls. 1,000 per student per year in a second-class four-grade village school; and 1,400, 1,600 and 200 rials per year in third, second, and first class six-grade urban schools. These figures are based on schools with 50 pupils per teacher, crowded into tiny rooms and given the bare minimum of the official program, which itself is probably less than minimum in standard. The official estimate of capital investment unit costs is 1,500, 2,000, 3,000, 4,500 and 6,000 rials per child in the five categories of elementary schools mentioned above. These figures appear to correspond to the actual costs of officially-supervised elementary school buildings erected during the past year, but are far in excess (perhaps 2½ or 3 to 1) of the costs of locally-supervised buildings. They also are calculated on the basis of a 50-pupil class, that is, a 300-student school in a six-room building, a condition which would appear to make the title "first class school" a denial in terms.

At the secondary level no official estimate of the per pupil cost of instruction can be made of Government schools. The cost analysis of what is perhaps the best private secondary school in Iran, offering a program far in excess of the official requirements, is Rls. 12,500 per student per year. It should be noted that this should be rather higher than the national average, as this school offers the full six years of work whereas the national secondary school average has a higher percentage of three- and five-year schools whose cost per pupil is lower.

The per pupil operating costs of the various technical schools are meaningless, since they are used to only a fraction of their capacity. Their construction costs, however, are pertinent. The per pupil construction cost for the most recently completed official honaristans is approximately Rls. 25,000 based on designed capacity. On the basis of actual use, the per unit construction cost is closer to Rls. 250,000. The most notably low cost is the Rls. 4,500 per pupil for a private girls' honaristan constructed by the Zoroastrians in Kerman. The per pupil operating cost of the Ministry of Labor prototype trade school in

Tehran is at present Rls. 2,700 per year. This might be lowered by as much as 50 per cent when the school is operated to maximum capacity, but it does not reveal a true per unit cost because the administration salary costs are not included. The construction cost, including equipment, was Rls. 20,000 per present student, and again this might be lowered by as much as 50 per cent if used to full capacity.

The per unit operational costs of the four Faculties of Tehran University which have most direct bearing upon the Seven Year Plan are significant. The Faculty of Science has averaged Rls. 7,800 for the past three years and the Faculty of Agriculture is Rls. 43,000 per year for boarding students, including living costs. The Faculty of Veterinary Medicine declined officially to provide cost data, but costs are estimated to be approximately Rls. 50,000 per year for students who are not boarders but who receive Rls. 600 per month living allowance. The Faculty of Engineering has not been able to furnish a cost analysis. The average cost of educating a university student in England in a technical field, based on the figures for engineering students of the Anglo-Iranian Oil Company, has been £400; while in the United States, based on figures supplied by the United States Embassy, it is estimated at $2,500. These figures include all expenses for tuition, room and board, and incidentals, but do not include travel expense.

The cost of boarding a student in Iran varies greatly from one locality to another and between private and Government schools. A few figures will serve as a guide. The cost in the Meshed area ranges from Rls. 1,000 to 1,200 per month for Government-operated schools, and about Rls. 800 per month for private schools. In the Birjand area only Government costs are available, and these run approximately Rls. 2,000 per month. In Zahidan, also, only Government costs are available and these are approximately Rls. 1,000 per month. In Bam the Government costs approximate Rls. 600 per month. In Kerman the Government cost is Rls. 800 per month, while the two privately-operated boarding schools cost Rls. 300 and Rls. 200 per month and apparently offer a better standard of living. Government costs in Tehran are Rls. 1,500 per month; 1,100 in Hamadan; 1,650 in Kermanshah; 1,450 in Tabriz; 1,550 in Resht; and 1,550 in Rezaiyeh.

Rental costs cannot be generalized, as they are affected largely by the local pressure for building and the date from which the rental contract was signed. The costs of relatively comparable quality of buildings vary from a minimum of Rls. 350 per month in Sabzavar to as high as Rls. 12,500 per month in Tehran. Even if it is granted that the Tehran school used as an example is nearly twice as large as the Sabzavar school, the disparity is obvious. It is impossible for the Iranian Government to give an accurate estimate of the percentage of Iranian schools which are in rented buildings. The Ministry of Education estimates 70 per cent are unfit to use. The proportion is certainly very high.

CONSTRUCTION

There is apparent a strong trend toward producing standardized school structures throughout Iran. Thus the elementary schools are almost universally buildings with six class rooms, a director's office, a room for the servant or custodian, a long corridor off which open the classrooms, and, in the larger urban type, an assembly hall, possibly a small room for the administrative staff and teachers, and a library. In all but a few cities the school grounds are ample, frequently immense, with provisions for sports of all types, volley ball, basketball, football, and occasionally gymnastics being the most common.

Toilets are almost invariably slit-trench type and housed in a separate structure at a distance from the building.

Water supply varies with locality but always includes a source of "running water or a pool" required for religious purification through ablution. Usually there is in addition a local well, and if this is not feasible there is drinking water in barrels purchased from the local water distributors.

The construction material varies with local supply, but fired brick with hard lime mortar is the most common, while cut stones in the southern mountains, sun-dried brick covered with plaster in some parts of the desert plateau, and wood in the Caspian littoral, were observed. Roofs are generally metal in the cities and circular domed mud and straw mixture in the desert areas. The classrooms are generally white line plaster unpainted. The floors are usually tile, unglazed tile, or cement block.

Blackboards are usually merely a painted place on the wall, or a movable wooden board painted black. Individual desks or combined table and chairs are virtually unknown and the usual equipment is a solid row of wooden desks and benches, cheap to construct but utterly unsuitable to any modern program of education. In the Khuzistan area, near a seaport, the cost of locally-manufactured desks is higher than first quality imported ones. No schools have real central heating, but a few of the latest to be constructed have a modified form of built-in stove which provides fairly efficient heating. The electrical equipment is extremely poor, usually consisting of an amazing wiring pattern of poorly-insulated wires strung from nails or insulators attached to the walls and passing through simple holes in the partitions. Few schools have any piped water systems or indoor toilet facilities, and almost all of these are invariably out of order.

The prototype of secondary school construction is the relatively standardized "Hekmat Secondary School" found in most large cities. These are from ten to fourteen years old, and while modified to fit the local terrain, climate, and source of building material, all bear a characteristic stamp. They normally have from six to eight classrooms, one to two laboratories, a director's office, a teachers' room, a large assembly hall, a library, and servants' quarters. Some of the larger have sports and extra-curricular activity rooms. Most of them show marked deterioration inexcusable in buildings so new, but their construction is generally much better than that of the elementary schools. They also have large sports grounds and frequently pleasant gardens. Unfortunately they suffer from the same deficiencies in plumbing, electrical wiring, and heating facilities which characterize the elementary schools. Their classroom equipment is the same as the elementary school, built on a larger scale for older students, and is equally inappropriate to a modern program.

No teacher training schools visited, except in Tehran and Rezaiyeh, were in new buildings, and their existing equipment is inadequate, dirty, crowded, and wholly unsuited to the preparation of future teachers. The students sleep in crowded dormitories with no privacy and virtually no personal comfort. They eat in barren, unpainted, dirty dining halls; in one case they have to stand up while eating. The kitchens are extremely dirty and inadequate. About half those visited had no bathing provisions, the students being forced to use a public bathhouse. Hygienic conditions were at best mediocre and at worst deplorable, with, for example, toilets that had no paper, water, or ewers and were located next to the well.

When the Tabriz and the Ahwaz technical schools are completed, Iran will have six excellent school plants for this type of study: four new, one in Isfahan quite new, and one in Tehran older but adequate. The newer ones are made simply of reinforced concrete, brick and plaster, with the best quality construction observed in any Iranian school buildings.

Most of the newly-built Iranian schools, however, have not been constructed with any careful estimate of their probable life. A temporary building is justifiable if its cost is low enough so that it can be written off as an expendable item after a brief period of time. When estimating the probable life of a school two things should be taken into account which appear to have been overlooked in the Iranian construction. The first is that the construction should be of a standard quality; it does no good to put very large expenditures into expensive window casements and interior plastering, for example, if the roof construction and the framework of the building is cheap. New Iranian schools appear to have brick construction that will last for 40 to 50 years, but the electric wiring, rain gutters, and roofs are almost universally bad.

The second element in the length of life of a building is its maintenance. It seems to be a universal fault in school construction that, once the building is completed, all interest in its upkeep ends. It was observed repeatedly that marked deterioration had set in before the construction was even completed, much of it needlessly. A few rials spent in paint and roof repairs would save very large expenditures later for replacing fallen ceilings, warped woodwork, doors and windows. While the determination of standard maintenance costs is a technical question requiring additional study, the rough rule of thumb used in American schools may be helpful. The annual cost of maintenance equals the total original cost of the building, divided by the probable number of years it is to be used. Maintenance, therefore, will equal five per cent of its cost per year for a building which is designed to last 20 years and three per cent for one which is built to last 33 years.

In future Iranian schools it should be possible to improve their quality without increasing expense, and in some cases to effect a positive saving. There is no excuse, for example, for erecting a new building in which classrooms are so arranged that the light comes over the right shoulder of the student, assuming that the majority of the students are right-handed and the arrangement throws a shadow on their writing. There is no need for a large assembly hall except in large city schools. Use of movable partitions constructed of hinged doors, which permit opening up two or three classrooms into one large room on the infrequent occasions when an assembly hall is needed, is a far more economical solution. A little forethought will locate hygienic facilities and water supply on opposite sides of the school ground, and will ensure that the carefully-located well is not separated just by a fence from some neighbor's latrine. As we have said earlier there must be an entirely new attitude toward laboratories and libraries, which, then, will become among the most important parts of the school plant.

Finally, a very careful survey should be instituted of the existing expenses for rented buildings. It should be possible in many instances to construct new official school buildings and to amortize, or very nearly amortize, their cost out of the saving in rental. This is a local problem which must be solved on a local basis, but every encouragement should be offered to make this conversion.

SUMMARY AND CONCLUSIONS

The principal characteristics of Iran's present educational system have been described and evaluated earlier in this report. It is evident that illiteracy is critically and unnecessarily high; that educational expenditures are lower than required, as well as wastefully applied; and that good teachers are few and difficult to secure under present salary and teaching conditions. Likewise, it is clear that present curricula are overcrowded and usually too theoretical; that training for leadership, or for the humbler skills required for national development, is grossly inadequate; that public health and agricultural education are far below national needs; and that school facilities, equipment, libraries, books and teaching materials are generally lacking both as to quantity and quality. These shortcomings can materially affect the degree of success attained by the Seven Year Plan and the ultimate national well-being, in addition to raising serious problems as to the Plan Organization's own educational program.

The majority of the above shortcomings, however, are symptoms rather than causes of the educational failure. Thus, even if one concedes that illiteracy is widespread and that it indicates a deficiency in the educational system, it does not necessarily follow that illiteracy is the cause of the manifest social ills, for it may well be the result of them. If illiteracy is primarily a result of social ills rather than a cause, not only will remedial measures such as adult education, anti-illiteracy campaigns, reformed teaching methods and more schools be needed, but it also will be necessary to remove the original social causes of illiteracy. Similarly, while recognizing that women's education is defective, any proposed reform will depend not solely upon wiping out the obvious discrepancies between women's education and that of men, but of attempting to determine what are the social causes which create this discrimination, and after that of systematically reforming them.

The first step, then, in instituting fundamental educational reform in Iran must be a critical analysis of the obvious points of educational failure with the purpose of diagnosing the basic social ills which caused them. The conclusion that the basic educational philosophy and the past social and political philosophies of the nation have proven unsuitable to the demands of modern Iran has resulted from this analysis. On the assumption that this basic philosophy will be changed, and is in fact in the process of change, the next step is to try to seek out fundamental educational problems which will result from this new philosophy. If these can be discovered and corrected, it logically may be presumed that most of the symptomatic educational failures will in time be cleared up almost automatically.

There appear to be five fundamental social and educational problems. How can unacceptable ideas and attitudes be changed? How can existing manpower be mobilized? How can a trained personnel be assured? How can the educational system be made more efficient? Finally, how can the immediate educational emergency of the Seven Year Plan be met?

CHANGING ATTITUDES

If it is conceded that there exist unacceptable social attitudes, and Iranians are almost universally agreed that they do exist, there appear to be three means by which such attitudes can be changed: through fear, by force of law, or through self-interest. Consideration of an example will clarify the analysis: namely, the attitude of a considerable number of large landowners toward the education and health conditions of their tenant farmers.

Approximately 80 per cent of Iran's population is rural, of whom an enormous number live as tenant farmers on land which is either owned or rented by wealthy landowners. There can be very little doubt that the vast majority of these tenant farmers exist in a perpetual state of economic misery. So widespread and so obvious is this misery that it has constituted one of the chief reasons for the Iranian political determination to embark upon the Seven Year Plan.

Even the majority of large landholders are willing to concede that their tenants live in deplorable conditions; yet most of them have failed to take any positive and effective measures to change the situation. This is evidenced by the widespread failure to comply with the law which makes it obligatory for the landowner to provide a school building for the instruction of the children of his tenants, a fact which has already been noted and which is statistically demonstrable from the records of the Ministry of Education.

The common excuse advanced by such delinquent landholders is that their income from the land is not sufficient to meet the cost of such services. This excuse can be rejected on two grounds: the majority of villages show evidence of the marked flow of rural population toward the cities, with the consequent freeing of existing buildings which might be converted into schools at a very modest expense; and the incomes of these landholders indicate that the villages evidently are being operated at a substantial profit. It may be concluded, then, that there exists among the large landholding class an attitude which is socially unacceptable and which is in contravention of the spirit of existing Iranian law.

One means of changing such an attitude is by the fear of the possible danger resulting from it, and this is already beginning to change the ideas of a few. The more intelligent landholders reason along the following lines: "If something is not done to improve the situation of my tenants, they will become fertile material for great social and political unrest. As such fertile material they may easily adopt revolutionary tactics; if not actually revolting against established authority, at least sabotaging my crops or concealing the produce which is my rightful share. No official agency has yet been able to meet this desperate situation adequately. I do not dare wait any longer for someone else to correct the situation. Therefore, I must voluntarily surrender a part of my potential income in order to correct some of the deplorable social conditions of the tenants, or I am likely to lose all of my income."

The majority of landlords, however, remain unmoved. They have quieted their inner doubts by the belief that two great social forces will prevent any such social catastrophe, and they frankly and openly admit that they plan to make full use of these instruments: religion and patriotism. Their position appears to be both socially unacceptable and historically naïve.

Force of law is a second device. Iran in the past has attempted to compel these large landholders to correct some of the more flagrant social abuses by passing laws, such as the one requiring the construction of schools. To date such tentative measures have not been effective, partly because a considerable number of the landowners have simply ignored the requirement, partly because they have been able to evade the intent of the law through some perfectly legal loophole.

A third potential means for correcting the situation is that of convincing the landholder that it is to his own self-interest to improve the social conditions of his tenant farmers. Since the major motive of such landholders is to operate the village at a financial profit, the obvious procedure for changing his attitude is to prove that he will make larger net returns from his land if he invests more money in the people who work it. In many cases this is relatively easy to do. In this respect a convincing case can be made for all forms of basic education; including among others the provision of basic skills such as literacy, agricultural and vocational training, and public health education.

It should be noted, however, that the process of pointing out self-interest will not meet all social needs. There must be developed, therefore, a social consciousness which is based upon something higher than the mere seeking of profit. This also is fundamentally an educational process.

MOBILIZING EXISTING MANPOWER

The fundamental objective of the Seven Year Plan is to raise the standard of living of the Iranian people. Education can make important contributions to the attainment of this goal. At the same time it must be remembered that the development of a comprehensive educational program capable of meeting Iran's long-range needs will depend in part upon an increased national capacity to provide the necessary funds. A simple principle provides the key to raising the economic level of the nation and, with more equitable distribution of the fruits of labor, increasing the standard of living of its people: the attainment of increased production through the more efficient utilization of the nation's existing potential labor supply and the more effective organization of its industry, agriculture and natural resources.

There appear to be at least seven points at which education can increase the net productivity of the existing potential labor supply, and hence make a direct impact upon the problem of increasing production and the standard of living: increased utilization of female labor, decreased labor losses due to ill health, increased utilization of nomadic populations, development of new attitudes, improved technical procedures, reduction of labor losses through improved industrial guidance, and reduction or elimination of traditions which oppose increased production. Specific recommendations for the solution of these problems will be presented later. At present it is enough to determine the existence and to explore the nature of the problems.

There can be little doubt that the potential female labor supply is not being used to anything remotely approaching its capacity. It is true that in villages and among the tribes the tradition of women working in productive labor is well established, although their utilization may not be technically efficient. In the urban areas, however, the vast majority of women restrict their activities to the home or to a very small group of professions which have social status. Thus, for example, the professions of nursing, stenography and office work, clerking in stores, and light industrial employment, which are almost universally considered highly acceptable positions for women in other countries, are almost wholly rejected in Iran.

In some few areas, such as the silk mill in Chalus, it is possible to find women in urban localities working with complete freedom in industry. We do not advocate that married women with small children enter gainful employment, but there always exists in any nation a considerable population of young unmarried women and of widows and married women whose children are grown. If Iran rejects as a principle the use of such women as productive labor, it will immobilize a considerable proportion of its adult population and impose upon itself an almost impossible handicap in industrial competition with other nations. Education might well guide public opinion and offer technical preparation for the gainful employment of these women.

There is an enormous labor loss existent in Iran through a deplorable state of public health. This results not alone from days lost due to sickness, but also from lack of efficiency while actually on the job. Education alone cannot cure or prevent these widespread health deficiencies, but it can co-operate to a very much greater degree than at present in the public health measures which might prevent them.

It is obvious that the economic production of the tribes, whether nomadic, migratory, or sedentary, constitutes a major item in the national income. Yet there can be little question that their manpower is used in an extremely inefficient way. There are at least three possible ways to increase this output: the tribal people can be shifted to some other and more productive form of employment, as was the case with the Arabi and Bakhtiari who are employed in the oil industry of Khuzistan and the Ghashghai in the textile mills of Fars; the tribal people can be settled in fixed abodes and encouraged to conduct intensive agricultural endeavors when irrigation or other land improvement schemes make possible year-round pastures; or the tribes may be settled and only the flocks move between winter and summer pastures with a small number of shepherds, while the labor supply of the remainder are utilized in sedentary employment. Whatever the ultimate solution, education may be effectively used to prepare the tribes-people for their new mode of life.

The three great areas of attitudes, vocational guidance, and tradition, have already been noted in some detail in connection with the evaluation of the existing educational system. The development of improved technical procedures is an integral part of the problems of increasing industrial and agricultural production, and will be considered in detail in the following sections.

DEVELOPING TRAINED PERSONNEL

The training of leaders raises important problems. There are three fundamentally different methods which can be employed: bringing technicians and teachers to Iran under contract; sending Iranians abroad; and the training of technical leadership in Iran. Each has its own advantages and disadvantages.

Bringing foreign experts to Iran, for example, has the advantage of a direct impact upon the many Iranians who would work under their supervision. Moreover, this procedure is partially self-liquidating in that many of the experts would be productively employed while training their Iranian replacements. On the other hand, language difficulties, lack of background as to Iran, and the difficulty of remaining abreast of new developments if remaining away from their native land for any substantial period of time, are among the handicaps inherent in this method.

Sending Iranians abroad assures the latest and best technical training and provides valuable contacts with foreign societies as well as with foreign equipment and methods. On the other hand, if the training period is long, the student will tend to lose touch with Iranian life and may find it difficult to readjust himself to it upon his return. Moreover, there is the difficult question of where the student shall study, a matter which depends upon cultural, diplomatic and foreign exchange considerations, as well as upon the type of technical training required. Where this policy is employed, it is most unwise to spread the training program over too many and diverse nations, as has been the tendency in the past.

The third alternative is the training of technical leadership in Iran. At the lower levels this is not only practical and desirable; it is probably the only ultimate solution which is economically feasible. But in the upper levels it depends upon original research and a self-generated higher educational system which, as was seen in the evaluation of the production of textbooks, is probably economically impossible in the foreseeable future. Such a program would certainly be enormously expensive and would be far too slow for an expanding industry.

Probably no single method is desirable as an exclusive policy. It seems evident that a combination of the three, in proper proportions at indicated levels of training, will secure the greatest advantage at the lowest cost.

There are three educational methods of securing a trained labor supply: training in industry itself in some form of an apprenticeship program; training in schools before employment; and through in-service training programs, such as night schools, after employment.

Training in industry by means of some form of apprenticeship program is well established in Iran and probably should become the backbone of any industrial training program. As now practiced, it is wasteful and unsystematic. Its major defect is that while it provides for the immediate labor demands of existing industry, it fails to create a basic labor pool of skilled artisans from which future specialized labor can be drawn. If put on a systematic and nationwide basis, however, in which even industries with a relatively static labor demand contributed their share toward building up the trained labor pool, this defect could be cured.

Technical training of skilled artisans in schools seems at first glance to be an obvious and unassailable solution. Actually, however, industrial training in technical schools has severe limitations. Technical schools independent of industry may be excellent for theoretical instruction and for teaching basic general vocational skills. They are quite incapable, however, of training either skilled operational or maintenance personnel for any specialized industry. This type of training requires experience on the specific equipment of that industry; the development of plant discipline which is impossible in a school; and an investment in equipment and materials which usually is too large for any school to afford. For example, it is possible to teach general theory of diesel engines on obsolete, relatively inexpensive equipment, but it is necessary to train maintenance personnel on the specific diesel engines used in a particular industry.

What almost inevitably happens in independent technical schools is that their program settles into a more or less stereotype, offering certain basic skills but not specialized training. If the technical school's program does not become too stereotyped, if it does not depart too far from the needs of local industry, and if it does not create future psychological difficulties through incorrectly convincing the student that he is a thoroughly trained technician who should command an immediate position of importance in industry, such technical schools are highly desirable as a device for maintaining the general semi-skilled labor pool of the country.

The third method, that of in-service training while employed in industry, has been attempted in Iran, principally in the anti-illiteracy night school classes created by the

Ministry of Labor. These are probably not too successful, as indicated earlier in the report, but the principle has some value if applied to purely technical skills. Such a program lowers the unit cost of instruction because the plant investment is borne by the industry. If properly directed it has the advantage of being directly linked with industrial need. Finally, absenteeism can be cut to a minimum, partly through plant discipline and partly because the student is on the payroll and hence not under financial strain.

For the production of an agricultural research class of personnel, little need be added to the general analysis already presented with respect to the training of the top levels of technical leadership for industry. Their training will differ materially, of course, but the same considerations of cost, of predictable returns, and of psychological adjustments holds for both groups. Specific recommendations as to the technical preparation of this class, including the skilled farm extension service worker, are given in detail in the agricultural section of this report. However, from a purely educational point of view, three problems are important: how to attract high quality personnel for the training program, how to make their period of training most effective, and how to make most effective use of their abilities once the training has been completed.

There are at least three methods of attracting personnel of high native ability for training as agriculturalists: incentives, status, and security. There must be incentives offered for entering this field of study. This has already been attempted by the Faculty of Agriculture at Karaj, but with only modest success, through offering full living expenses to the students while they are under instruction.

Students are attracted to a profession which holds a position of eminence in society. This status was increased when the Agricultural College was made a Faculty of the University. It could further be increased by consciously elevating its prestige through such devices as the offering of advanced degrees in agriculture, the development of recognized research and publication programs, and a continued campaign of public education regarding the importance of the field.

Fundamentally, however, able students will be attracted to the profession only when they can be offered a high financial return for their services upon graduation, good living conditions, and a high degree of future security. In none of these elements has the profession of agriculturist been successful in the past. Students have feared, and with reason, that they had no employment in prospect except as functionaries of the Ministry of Agriculture. They have been afraid of the hardships of living with their families for any extended period in the villages. Any free enterprise in agriculture, such as large-scale mechanized farming, has appeared visionary and speculative to the majority of those who in the past have been attracted to the program. Any agricultural education program of the future will be doomed to almost certain failure if this absolutely essential element, a recognizable and attractive market for the professional services of the graduate, is not provided.

There are three improvements which may well be made in the existing program with a view to increasing the effectiveness of the training period. The curriculum may be reformed. This is a technical matter which should be done only after extensive and detailed study by a committee of skilled agriculturists familiar with Iran. The period of instruction should almost certainly be lengthened from three to four years. The amount of practical work in agriculture should be markedly increased. It is generally considered best to have a considerable part of this practical work come early in the course and accompany the gradual evolution of theoretical studies. Vacation periods should be devoted to practical agriculture, not only to field trips for observation. In the fourth year of instruction there should be a basic separation into three levels of technicians: those who will continue theoretical studies and investigations to become the research personnel of future experimental stations, those who plan to become agricultural extension service agents, and those who intend to become instructors in the rural teacher training schools where men are to be trained for service in those rural schools where simple agriculture will in all probability become a prominent part of any future curriculum.

The problem of the effective use of the highly skilled level of agriculturist is primarily one of agricultural economics rather than of education. At one point, however, it is fundamentally a problem of formal education. If the technical information developed at the Faculty of Agriculture and the several experimental stations is to have any effect, it must reach the farmer. This process of influencing both present and future farmers is primarily an educational one. It probably can best be accomplished with four types of personnel: the agricultural extension agent who is primarily concerned with adult education, the practical agricultural specialist who accompanies educational mission units in a systematic program of short visits and demonstrations in isolated villages, the agricultural teacher in rural teacher training schools who makes his contribution indirectly through influencing future rural school teachers, and the elementary school teacher working in the village. The first two of these types are primarily agriculturalists. The latter two, however, are primarily teachers and should be trained, be under the administrative control, and be financed by the appropriate educational authorities. These alone need be considered here.

All former rural teacher training experiments and attempts at systematic agricultural instruction at the elementary level have failed primarily because of the unavailability of suitable teaching personnel. Teachers possessing the following characteristics are essential: knowledge of the people, the locality, the practical agriculture of the area, and the dialect if one other than Farsi is spoken; a temperament suited to living in the locality without becoming dissatisfied; psychological orientation toward practical work and not theoretical or academic verbalism; and adequate training in agricultural technology.

Securing such qualities in a teacher can only be accomplished in the mass by careful selection of original candidates. Thus, the prospective candidates for rural agricultural teaching positions must come from the local agricultural population and should be outstanding specimens of the peasant stock. While these candidates must not be urbanized in the course of their technical training, it must be conducted in a locality and under conditions which make the graduate a far better village dweller. Exactly the same incentives, but naturally on a lesser scale, should be offered to these prospective teachers as were outlined for the highest level of agricultural technical personnel: financial and educational incentives, social status, and future security.

INCREASING EDUCATIONAL EFFICIENCY

There are two types of educational efficiency. The first and most obvious is financial and administrative efficiency. It can be easily measured by certain statistical standards; for example, the unit cost of instruction, the unit cost of school construction, the percentage of wastage or attrition in a school age population group, the time requirements for any particular instructional unit, or the required personnel for any particular administrative service. This has meaning only if one fundamental assumption is true, that the product of the educational system adequately meets the needs of society. The other type of efficiency is more difficult to measure, yet is of far greater importance to the nation. It is the social efficiency of the educational process. Probably no quantitative measures can be made, but qualitatively such efficiency is determined by whether or not the educational process produces the desired attitudes and the required skills in a quantity which is necessary for the society. In an extreme form of failure of this type of educational efficiency the result is so obvious that it seems almost unnecessary to mention the principle. But in the vast majority of educational systems, and certainly in Iran, there exists a high degree of failure to achieve this type of educational efficiency which is so perfectly disguised by a spurious economic efficiency that the essential failure is not recognized. Thus, if a system produces physicians who lose half of their patients, it has obviously failed even if the per unit cost of educating those doctors was only a small fraction of that of another and successful training program. But if an educational system produces a population which is only partially literate, is uncritical in its thinking, is susceptible of easy political manipulation by an unscrupulous minority, or is only partly effective in its vocational skills, such a system has failed even though it may escape condemnation on the grounds of a low per unit cost of instruction.

There are two alternative methods of increasing the first, or economic, type of efficiency. One is to increase the intensity of administrative surveillance in order to insure compliance with regulations. The second is to establish a situation, probably through incentives of various types, which makes it to the individual's own advantage to increase overall efficiency. To a considerable degree these two methods comprise a choice of alternatives for increasing the second, or educational, type of efficiency. It will be recalled from a previous part of this report dealing with the adoption of a new educational philosophy that, if the creation of a democratic, basically self-directed citizen is to be the goal of the educational system, then the method of offering incentives and an appropriate social climate for such growth is necessary.

So apparent has this point been that a very large number of the leading educators of Iran are today committed to this fundamental shift. To most of them this is identical with rejecting the present French type system and adopting the Anglo-Saxon. Their assumption that these two reforms are identical is incorrect. Their conclusion that it would be wise to shift from the existing to some adaptation of a modern, decentralized administrative system, however, may be wise. Inasmuch as the characteristics and advantages of the modern, decentralized systems of education have already been discussed, they need not be repeated here.

It would be most unwise to copy any foreign system literally; for the act of copying is always an error. But if Iran is to reform the existing educational system in any fundamental way in accordance with the proposed change in educational philosophy outlined earlier in this report, it is evident that it will of necessity have to make a choice between one or the other broad general pattern. No other basic patterns exist in the modern world.

In favor of retaining but reforming in minor details the existing copy of the French system, it may be argued that, at least temporarily, Iran needs a strong central control over all information media, including education; that the present system tends to preserve certain traditional and presumably desirable cultural patterns, many of which have been adopted from the French during the past century; that the existing system is a "going concern" and is working with at least partial success; and that it would be better to repair it than to undertake the much larger venture of adopting a new system.

Against the retention of the present system, it is frequently pointed out that the French system has failed notably in a number of other nations which adopted it, specifically, Japan, Argentina and Brazil; that even in France there is powerful popular pressure to abandon it; that it inevitably leads to extreme bureaucracy, destroys initiative and leadership, reduces social mobility, and produces impractical, socially maladjusted graduates. Finally, it is pointed out that the system has been given a seventy-year trial in Iran and has failed.

In favor of adopting some modification of the American system, it is claimed that such a system largely avoids the defects of the French system; enlists the active participation and support of the local communities; exploits more fully the potential talent of a society and encourages social mobility; is highly practical; gives a general education to all, and specialized education to those who need it; and that history has favored those nations which put their faith in mass rather than selective education. Finally, it is pointed out that it has been notably successful in the United States, and that, if Iran is to make a change, it should imitate at least the fundamentals of the system which has had most success.

Against the adoption of the American system, it is argued that the total and per capita costs are much higher, because more people are educated and the activity program and decentralized administration are expensive procedures even when efficiently run, that there may be a loss of certain elements of traditional culture, and that the American system leads to over-specialization.

In justification of this last-mentioned viewpoint, it is pointed out that the average university graduate of certain European cultures, for example, the French, has a far greater knowledge of history, art, philosophy, and languages, than the average graduate of an American university. However, this observation overlooks the fact that the percentage of the total population which has been graduated from a university is immensely greater in the United States than in any European culture and that comparison of an average European graduate with the corresponding ten per cent of American graduates occupying the same relative position in the total population might be fairer and more enlightening.

The final decision must, of course, be a weighted decision, a calculated chance. A compromise choice, heavily weighted in favor of the modern, decentralized system, appears to be the wisest choice. It is obvious that Iran cannot immediately and totally discard the present system and throw the entire weight of educational direction upon the lay public and local educational authorities. It is equally obvious that, if Iran does not make very fundamental and far-reaching commitments to decentralization, educational progress will be difficult, if not impossible, to attain.

We recommend that the process of decentralization be gradual, and that it be completed by stages in which single elements of the educational process are completely decentralized. What the order of these stages should be is a matter for careful study and policy decision on the part of the Iranian educational officials. It seems evident, however, that among the first should be finance, the appointment of teachers, and the determination of curricula. If these are not decentralized, it seems unlikely that the program will succeed. In order to maintain minimum standards, it seems reasonable that the central authority, in the form of a much smaller and more efficient Ministry of Education, might offer federal equalization funds to local areas which are economically unable to support a desirable level of education, might establish broad and elastic minimum standards for teacher preparation, and might exercise control over the minimum core curriculum which it considers essential to national welfare. In both these latter cases, the word "minimum" should be emphasized and all pressure for the Ministry of Education to assume ever larger control over these functions should be vigorously opposed. As a rough rule-of-thumb, it would seem that national control over one-half the elementary school time, one-quarter of secondary school time, and one-quarter of teacher training time, while still exercising broad judgment over teacher licensing for employment in other localities, would be a reasonable compromise.

MEETING THE EMERGENCY

It is clear that Iran cannot undertake the entire program of reforms of its education system simultaneously. It is also clear that certain projects must have a very high priority because of the emergency created by the educational demands of the Seven Year Plan. In this connection, little profit would result from expending the very limited educational budget of the Plan Organization on a series of non-perpetuating, non-self-liquidating projects for training semi-skilled labor to meet sudden and localized needs. A limited number of such stop-gap training programs will be indispensable, but the main educational effort should be directed to more fundamental and lasting endeavors. We therefore recommend that a series of eight educational projects be undertaken, to be financed in part by Plan Organization funds and in part by the Ministry of Education, other Government agencies, private industry, private landholders, and various philanthropic foundations.

RECOMMENDATIONS FOR SPECIFIC PROJECTS

The eight educational projects which we recommend should be undertaken in connection with the Seven Year Plan program are as follows: (1) basic educational research, (2) decentralization, (3) rural education, (4) industrial and vocational education, (5) tribal education, (6) overseas specialized training, (7) teacher training, and (8) educational incentives. These will be discussed in the order mentioned.

EDUCATIONAL RESEARCH PROJECT

One of the most severe handicaps under which the Iranian educational system operates, and which could be an insurmountable barrier to lasting educational progress unless corrected, is the lack of any organization to provide the required scientific and technical direction. The Ministry of Education, which was organized and staffed to meet an entirely different need in an entirely different program, is quite inadequate to this demand.

We recommend, therefore, that a central agency, financed and administered by the Plan Organization, be established to give technical direction to the educational program. This central agency should have four functions: to plan for future educational programs; to provide a series of continuing educational services, to conduct a series of fundamental educational researches; and to assist in informing the public as to the educational needs, objectives, and programs in connection with the nation's economic development.

Planning

The efficient expenditure of the Plan Organization's educational budget, the mobilization of other educational resources, and the integration of the specific projects financed under the Seven Year Plan into the continuing and larger educational structure of Iran will require precise and detailed planning of the highest order. This planning agency must interpret general educational policy and make specific plans for its implementation, conduct a continuing appraisal of the results of past educational efforts, and amass and co-ordinate the information necessary for a continuing review and modification of the current program.

Educational Services

Iran is virtually without any scientifically-directed educational services. As the Plan progresses, there will be a demand for a large number of such technical services which cannot entirely be foreseen at this time. At least six are of such obvious and immediate importance, however, that they should be begun as soon as the agency is organized.

1. Curriculum construction. This service should assist local and autonomous institutions in the construction of curricula, based on studies of vocational needs, job analysis of positions in short-supply in the labor market, local needs, predicted future social demands, etc. The techniques of this curriculum construction should follow those found appropriate to the democratic, decentralized educational system recommended in this report.
2. Guidance programs. This service should assist local and autonomous institutions by setting up modern guidance programs based on the most acceptable methods, such as observation and rating techniques, autobiographies, psychological testing, interviewing, the maintenance of development records, and case studies.
3. Psychological testing. This service should assist local and autonomous institutions by providing a psychological testing service based upon tests which will have to be developed in Iran to fit the social characteristics of Iranian students. The service should conduct a program of compiling and statistically standardizing all forms of psychological tests (basic intelligence, mechanical aptitude, standardized achievement, etc.), and should administer and grade tests for educational and industrial institutions.
4. Educational surveys. This service should conduct technical educational surveys both in subject matter fields and also in geographical areas, as a means of evaluating the success of existing programs, of recommending future ones, and of correcting administrative and instructional inefficiency.
5. Textbook preparation. This service should conduct investigations into the best available teaching techniques, compile pertinent factual material, evaluate privately-prepared textbooks, interpret basic research on child psychology in terms of practical textbook preparation, assist in the physical design of textbooks, and render technical and financial assistance to local and autonomous educational institutions in the preparation of textbooks for special needs. A continuing program of the importation of model foreign textbooks designed for the appropriate age levels, to be studied for possible adaptation to Iran, is recommended.
6. National roster of scientific and technical personnel. This service should compile and maintain a continuing file of the available scientific and technical talent in Iran, to be used as a guide to the future planning and allocation of funds, for over-seas specialized technical training, and for the advice of responsible industrial and Governmental enquiries.

Fundamental Educational Research

Practically no fundamental educational research has been conducted in Iran. A small amount has been conducted by Iranians temporarily residing abroad, which is directly pertinent to Iranian educational problems. It is of paramount importance that a detailed and continuing investigation of certain educational areas be initiated immediately. Ultimately there should be programs of research into every part of the educational process. At least four should be given the highest priority: a study of the problem of the writing system, women's education, tribal development, and the legal and financial bases of the educational system.

Iran uses a writing system which is entirely local, although closely related to the Arabic used in a number of neighboring nations. It has been widely alleged that the use of this writing system has been a major cause of the high percentage of illiteracy in Iran. This, if true, would be an almost compelling reason for rejection of the system and the adoption of some simple, international, phonetic alphabet; presumably a modified form of the Latin, as was done in Turkey in 1928. Incomplete and rather superficial investigation of this problem indicates that this is problably not the case, as Iranian children and adult illiterates are able to learn to read and write in a period comparable to children in a European language if given systematic instruction with a modern methodology. The problem is definitely not in the order of magnitude of that faced by nations having an ideographic writing system, such as China and Japan.

There can be no doubt, however, that the continuation of the present system erects a cultural barrier between Iran and the Europeans; increases business expense because of duplication of typewriters, etc; makes difficult the adoption of a modern communication system, because of the duplication of teletype equipment and the unavailability of international trunk lines as extensions of the domestic system; increases enormously the difficulty of developing a modern scientific literature in Farsi; and is an inefficient writing system for technical reasons, inasmuch as the differentiation between symbols is so slight that writing requires a high degree of skill for accurate presentation, and the omission of vowel signs imposes an unnecessary handicap on the reader in reproducing the intended message.

In support of the present script, however, it must be pointed out that it is rapid to write, it is the key to a great body of poetic literature, and it has powerful traditional and emotional ties with the Islamic and Arabic heritage.

It is obvious that before any policy can be adopted with regard to this fundamental educational problem, a great deal of very detailed research must be carried on. The urgency, however, cannot be over-emphasized. Iran does not now have a high degree of literacy or large volume of technical literature. Before it makes the enormous investments which are contemplated in the next decade, it would be well to have established a definite and fixed policy as to whether this writing system is to be retained or abolished.

The research should include at least three separate investigations. The first should be a linguistic analysis to discover what are the relative advantages of the present system; the present system with certain modifications (such as writing in the vowels, writing symbols the same at any point in a word, and eliminating all but one Arabic symbol for the same Persian sound); and some other and international alphabet, such as the Latin. The second should be a methodological research to see what are the respective results when traditional Persian script is taught by each of the several methods, such as, for example, those of Messrs. Z. Behruz, Baghchiban, Shahab Ferdows, Hushyar, Roshdieh, Bijan-Mahdad, Salim Neissari, and the American, Dr. Laubach. No valid comparison can probably be made of the results of these studies and the speed with which Iranian children learn Latinized Farsi until similar methods, comparable to methods of reading instruction for American children in English, have been developed in Iran. The third type of investigation should be an economic and sociologic analysis of the results of any proposed modification of the writing system. This would include estimates of the period of time needed for change-over; the cost of the added instructional program during the change; the replacement costs of printing equipment made obsolete by the reform, etc. The experience of Turkey following its 1928 reform of the writing system is an obvious guide and should be studied with great care.

We recommend that the possibility of a compromise solution to this problem be considered. The adoption of some modification of the Latin alphabet (now virtually the international alphabet) for mechanical communication systems, for scientific writing, and for the lower levels of mass education media, such as use in elementary schools, in newspapers directed to the masses, and in adult information services, seems possible and desirable without in any way jeopardizing the status of the present system as an instrument of the erudite. The mastery of the current Persian script, without any simplification or modification, might well be a requirement of secondary and higher education in such a case, as a continued link with Iran's great literary tradition.

A basic research into the problem of women's education is a pressing requirement. This should be studied from at least four points of view: the potential vocations for which women are especially suited or could easily be educated, the existing local prejudices and traditions which make certain highly respectable professions for women unacceptable, possible methods of overcoming local prejudices and traditions, and the methods whereby women can be trained to meet their new and enlarged social responsibilities.

The third major research area which should be undertaken without delay is that of tribal development. It is essential that Iran do something immediate and basic for the development of its tribal population. This is an extremely complex problem, and one for which it may be very difficult to find an equitable solution. As a partial guide we recommend that the experience of the United States Bureau of Indian Affairs be studied, both for its failures and its successes. It is upon the basis of fundamental research that the success of the tribal education project, one of the eight projects here recommended, depends. The study should include a detailed analysis of the economic and sociologic conditions of the individual tribes and should be directed by a cultural anthropologist who has had training and experience with other nomadic or migratory populations. An important element of this study should be the development of a systematic co-operation with the recognized leaders of the tribes in determining a solution to the problem and later of implementing the indicated program.

With regard to the specific educational problem faced by the tribal people, it is recommended that the suitability of one of four possible school organizations be investigated with respect to each tribal group. The first is the moving school, designed to accompany the tribe while in its annual migrations. Such a school has three serious defects in that it cannot carry adequate teaching materials with it; must compete with the time requirements and novelties of each day's progress; and that the teacher is likely to be forced by local custom to become hardly more than the personal secretary of the local chief. Its only advantage is that it does provide some education for the children of tribes which spend a major portion of the year in migration.

The second type is the dual school, with a building in the winter quarters and one in the summer. This has many advantages, such as stability, equipment and prestige, and also the disadvantage of higher capital investment. It can be successful only with those tribes which have relatively short periods of migration and long periods of sedentary grazing, and is only possible when a revision of the present educational laws permit local determination of the periods of schooling and vacation.

The third type is the boarding school where tribal children may be left while their parents are in migration. This has all of the obvious advantages of a boarding school. However, it has the two extremely great disadvantages of very high per-capita cost and of separating young children from their parents. If adopted, it seems certain that either the national Government or the tribal chiefs must contribute a part of the expense as a means of spreading the cost over a larger segment of population, since a study of the unit cost of boarding, taken as an average Rls. 1,000 per month, would indicate that the average tribal family does not produce enough wealth to support three children in such boarding schools for six years each of compulsory education.

The fourth, and probably best solution for most tribes, is the establishment of a single village school in the area of pasturage where the tribe spends the longest period during the year. The period of compulsory education could be shortened in months per year but lengthened in total years to ensure parity with the educational opportunities of children of urban dwellers. If it should be found feasible to settle the families and permit only the flocks with a small number of shepherds to accompany them to perform the annual migration, this fourth type of school seems a likely solution.

It is evident that there will be a complex and continuing reorganization of the legal and financial bases of the educational system made necessary by the various educational reforms. This will necessitate continued technical investigation of the legal and financial structure which is quite beyond the means of the individual institution. It is recommended that this be conducted by the Planning and Educational Project as an educational service to all institutions.

Information as to New Programs

If a program of fundamental educational development is adopted, and based upon a decentralized administration, it will be necessary to know what people think about educational problems and to make available information to guide them in their thinking. It is therefore recommended that work be done in this field by the educational section in co-operation with other appropriate units of the Plan Organization.

DECENTRALIZATION AND EDUCATIONAL DEVELOPMENT PROJECT

As developed in the preceding portion of this report, the high degree of centralization of educational authority has proven to be a major impediment to progress.

We therefore recommend that two parallel and assisting projects be undertaken. The first is the progressive decentralization of the existing educational system, to be financed and administered by the Ministry of Education, with technical assistance from the educational section of the Plan Organization. The second is an intensive and continuing program of educational reforms and technical improvements within the existing educational system, to be a joint effort of the Ministry of Education and the education section of the Plan Organization.

The goal of decentralization should be the gradual shift of administrative responsibility for the educational system from the Ministry of Education to the local authorities. The Ministry of Education should concurrently assume the major responsibility for primary research, planning, and supervision.

We recommend that the Ministry of Education be gradually reduced in size, increased in efficiency, and ultimately that it be merged with (on the basis of parity, not a simple absorption of) the educational section of the Plan Organization. We recommend that the educational section, during the existence of the Seven Year Plan, be operated as a streamlined, highly efficient prototype of the eventual reorganized Ministry of Education.

New personnel will be required in nearly all instances, inasmuch as the present ministry staff is unskilled in the operation of a modern decentralized system. We recommend that existing personnel be given time and opportunity to elect one of three professional options: to retrain themselves in the techniques necessary under the reformed system; to shift to other positions, such as teaching or administrative positions in individual schools, with no loss in salary or tenure; or to be put on the disposability list as the most effective means of reducing an inevitable loss. The new cadre, whether existing personnel or entirely new personnel, should be oriented along one definite and consistent educational theory. No attempt to mix the elements of the French and the Anglo-Saxon systems of education has proven successful in the past or appears to offer hope for success in the future. The two systems are too incompatible for any real compromise or fusion. The result would almost certainly be inferior to either.

The method of making the shift from centralized to decentralized administrative control is of great importance. We recommend that it be gradual, but that the stages be by function, such as finance, appointment of teachers, curriculum construction, and not by degree. We recommend that the shift be first to the ostans, then to the municipalities, and finally to the individual schools. It is suggested that the present policy of permitting individual municipalities to exercise semi-autonomous administration with direct access to the Ministry of Education be discouraged. On administrative matters it seems wiser to have them under the immediate direction of the ostan office of education, which may grant any degree of authority to a sub-unit that is deemed advisable. On technical matters, such as information on research or access to professional services, all educational sub-units should have the right of direct access to any agency at any level.

The existing plan of educational councils should be extended to all ostans and municipalities, and they should be given far greater powers to administer their respective units. The Home and School Co-operative Society should be encouraged to establish units in every school and to undertake a much more active program of lay participation in school matters. Teachers should be encouraged to organize into faculty groups, and a non-political national teachers' association should be organized. This national association should establish forums, publish a professional journal, conduct an entirely professional and non-governmental program for the investigation and accrediting of schools, and affiliate itself with some recognized and responsible international teachers' organization.

We recommend that supervision on the part of the Ministry of Education over ostan offices and of ostan offices of education over municipal school systems be technical and advisory, and not administrative or disciplinary, and that the municipal school directors, together with their local educational councils, be granted authority to assume increasing control over the selection and appointment of teachers, the determination of curricula, the adoption of textbooks, the construction of schools, and the financing of local educational needs. The National Ministry of Education, however, should be empowered to determine and establish minimum standards, and to encourage local compliance with them through control over the payment of national equalization funds.

Technical Improvement

The process of decentralization and of educational reform will require a high degree of technical supervision, and on many occasions a judicious application of pressure. This can be done most effectively through financial controls. Since the education section of the Plan Organization will control a considerable amount of money which it may use as incentives to change, it is desirable for this agency to have an inspection unit which can be sent into any part of the system to investigate and report on the conditions existing there. A small and highly qualified group of technicians, responsible only to the director of the education section, should be established and empowered to investigate, to report on efficiency and compliance with agreed-upon programs, and to recommend changes. Actual administrative changes leading toward a greater efficiency should be made the direct responsibility of the Ministry of Education.

RURAL AND AGRICULTURAL EDUCATION PROJECT

The objective of the rural and agricultural education project is to make available to the farmer specific practices which will increase his productivity and hence help to raise his standard of living. This project is not aimed at the production of original research, the latter being properly the function of the agricultural section and related agencies of Government.

It is therefore recommended that four programs be undertaken by the education section in co-operation with other existing and indicated agencies: establishment of a four-fold village development program, the inauguration of travelling educational missions, preparation of rural elementary school teachers competent in practical agriculture, and the improvement of existing higher educational institutions producing skilled agriculturalists.

The Village Development Program

The productivity of a typical Iranian village can be markedly increased through educational means if people are made literate, their health improved, their skills developed, and if they are trained in simple agricultural technology. We, therefore, recommend that a village program be inaugurated to accomplish this four-fold purpose. The experience of Dr. James Yen and his associates in the twenty-five year experiment known as the Mass Education Movement in China is directly pertinent and should be studied with very great care, even though the Second World War and present unsettled conditions in China have virtually ended this great experiment.

The local school teacher, usually the best-educated member of the village, should be made the local director of the program, and the school building used to house the project. The education section should supply the technical supervision of the project and cover the initial cost of training the village school teachers who are to conduct the program, but all other expenses should be allocated to the other appropriate Plan Organization's function, Ministries, and other legally responsible parties.

Fortunately, the more than 40,000 Iranian villages tend to cluster in 892 groups. A single school will be feasible in many of these. If, however, it is estimated that an average of three schools per group, or a total of 2,676, would adequately serve the rural population, and if these schools were standardized as four-grade schools instead of six-grade, a total of 10,704 teachers would be required. This estimate is based on the assumption that it is desirable to have a separate teacher for each class. If, however, one out of the four teachers in each typical rural unit need be charged only with the administrative details and anti-illiteracy portion of the program, then the personnel target of 8,028 teachers will suffice for the village development program. However, their training must be radically different from that of any teachers now available.

The feasibility of creating approximately 2,700 new schools in the next seven years may be questioned. There are at present almost exactly that number of rural and urban elementary schools in Iran. Such a program would mean roughly doubling the number of existing elementary schools, but would mean considerably less than doubling the number of school rooms, because the new rural schools would be four-grade rather than six-grade. The unit construction costs of first quality rural schools is less than one-half that of the average urban cost. It therefore is possible to estimate that the actual construction program would be considerably less than one-half the cost of duplicating existing schools, a figure which lies well within the trend curve of normal construction and rental at the rate accomplished during the past fifteen years.

The actual course of instruction should be determined by careful co-operation between the four agencies which will be directly interested (education, industry, public health, and agriculture), and should be modified as the program progresses. Certain general characteristics can be predicted with some certainty. The anti-illiteracy program should be both a direct attack upon future illiteracy through the training of all normal village children in the regular school program, and should attempt to correct, at least in some degree, the existing adult illiteracy.

One striking fact in the present educational situation in Iran is the high percentage of children attending rural schools who state that their parents are illiterate. This indicates both a changed social attitude and an enlarged educational opportunity. We recommend that suitable textbooks be prepared and that the children in the schools be given specific training and encouragement to teach their parents how to read. This is not a visionary possibility, as this technique was used with great success in both Mexico and Chile.

The public health function of the program should be closely co-ordinated with the over-all program of the Plan Organization in that field. It should include practice in spraying and other insect control, proper construction and maintenance of latrines, simple precautionary measures with regard to a potable water supply, careful regulation of the public bath, simple precautionary and treatment measures with regard to trachoma, and intensified hygiene in the home. The handicraft program should teach the manufacture of articles which have current sales value regardless of whether or not they may be judged artistically worthy on a theoretical basis. The agricultural program should follow the lines laid down by the agricultural extension agent for that region. It should include care of a school demonstration garden or farm, training in the use of proper seeds, practice in simple preventive measures for control of plant and animal diseases, up-grading of poultry, improved techniques of tilling the soil, and demonstrations of desirable practices in farm and irrigation construction.

Travelling Educational Missions

Experience in other rural agricultural programs has repeatedly demonstrated that the interest of peasants will flag and the majority of farmers will revert to their traditional and out-moded practices if there is not a systematic and recurring infusion of new ideas and enthusiasm from an outside source. Some method is necessary to hold and stimulate their interest, and to increase the prestige of the demonstration farmer during the periods of waiting.

We therefore recommend that there be initiated a series of travelling educational missions which will systematically visit a series of village groups, give demonstrations in support of the four-fold village development program, leave new instructional material, make arrangements for the delivery of needed handicrafts, public health, and agricultural material, and stimulate the interest of the villagers. These missions should be primarily devices for supporting existing and more substantial programs, a form of adult education, rather than travelling schools which make a lasting effect upon the community through their own teaching. The techniques and results of the Mexican Educational Missions (Missiones Educacionales), and of the Chilean Institute of Rural Information (Instituto Infomación Campesino), although both are today virtually discontinued for various economic and political reasons, are directly in point and should be studied.

These missions might well consist of a specially equipped truck, carrying motion picture projection equipment, a public address system, stores of informational material and supplies for the public health, handicrafts and agricultural program, and outfitted with a self-contained living unit for the crew. The crew should consist of a driver, capable of operating the various projection and public address equipment, an educational director trained in handicrafts and anti-illiteracy techniques, a sanitarian, and an agriculturist.

If each unit is in the field for a period of 36 weeks in the year, plans to visit a village group at least twice in a year and to spend an average of three days with each visit, a total of 25 such missions could render service to the 892 existing village groups in the country.

It is recommended that some program be adopted similar to that which proved so effective in Chile, where one-quarter of the entire nation's population was reached at a cost less than the construction and operation of a single urban secondary school. This might well take the form of an entertainment program the first evening and demonstration classes given during the following two days, ending with a public rally at which prizes would be distributed for excellency and attainment in literacy, agricultural production, school attendance, health records, and handicraft production. A correspondence service, including a mail-order purchasing service for outlying areas, with postage-franking privileges, is recommended as a technique for maintaining contact with the rural groups and of stimulating literacy. Interest-arousing devices, such as the reproduction on the panels of the truck, in colors and on a large scale, of the adult text-book designed for the children to teach their parents, should be made an important and integral part of the program.

Rural Teacher Training Schools

There can be little doubt that there is and will continue to be a desperate demand for trained rural elementary school teachers.

We therefore recommend that there be established a series of institutions designed specifically to train teachers for employment in rural elementary schools. These schools should offer a two-year course and accept students who are residents of the rural areas, have completed the first cycle of the secondary school, and have indicated a willingness to go to the villages for a period of not less than five years to teach in rural elementary schools. They should be boarding-in type and should have a curriculum designed specifically for work in the village development program. One-half of the time in the school should be devoted to agricultural and public health studies with the emphasis upon practical field work.

We suggest that the students be recruited from small towns and villages, and that preference be given to young men of character who have demonstrated practical ability in agriculture. We further suggest that incentives be offered to attract the best possible talent, possibly in the form of double pay and double tenure rights during the period of village teaching, provision of suitable housing while in the village, and of the payment of a small stipend beyond the normal grant of free board and room while studying at the teacher training school.

The number, size, and location of the rural teacher training schools are matters for determination after a careful analysis has been made of local needs. We recommend that the program should initially plan for the establishment of ten such schools and that the size of each be set at approximately 160 students, thus ensuring an annual production of approximately 700 rural teachers, after allowance is made for wastage. During the first four years of the program these schools should be operated at approximately double capacity (through the temporary devices of double-deck bunk beds, shifts in the dining hall, and alternating classes in the laboratories, classrooms, and shops) to provide for the emergency demand for rural teachers.

Ultimately it seems reasonable that there should be a rural teacher training school located near Rezaiyeh, Tabriz, Resht, Gurgan or Sari, Meshed, Zabol or Zaidan, Shiraz, Isfahan, Hamadan or Kermanshah, and Ahwaz. The existing school at Sari should be used, at least temporarily, and enlarged as to buildings, equipment, and farm lands, and the possibility of adapting the former model village of Fariman should be considered. This would have the advantage of providing immediately an almost perfect physical setting for such an institution, since it is near a large city but not in it; there is an adequate supply of excellent buildings which merely need some repair, it is located in the center of a large agricultural district and there are available electric power, water for irrigation, two disused but restorable small industries, and public health facilities in the form of a small hospital. We recommend also that the former Presbyterian Mission Compound on the outskirts of Rezaiyeh be considered for adaptation for such a school.

A continuing supply of agriculturally-oriented teachers will need to be trained in the rural teacher training schools. We therefore recommend that one of the options given students during their fourth year at the Faculty of Agriculture should be that of spending one year, with the privilege of a second at full pay, as an instructor in practical agriculture at a rural teacher training school. Such an option should be attractive to the university agricultural student who does not aspire to research work and who feels that his future in agriculture requires further experience in the practical management of a farm. Such a period of teaching would give the graduating student immediate assurance of a paid position, and would permit him to try out his theoretical knowledge under controlled conditions while securing practical experience in cost accounting, personnel management, machine equipment operation, and practical agriculture of all types.

The directors of these schools should be trained agriculturalists, and the heads of each teaching department involving agriculture should be graduates of the Faculty of Agriculture.

Higher Agricultural Institutions

The specific changes which should be instituted in the existing higher institutions for agricultural training, and the creation of new ones, are primarily a matter of technical agriculture.

The general educational implications have been presented in the section analyzing fundamental educational problems in Iran. The only direct connection which such university and post-graduate institutions will have with the rural education program is the preparation of technical information, which will be the subject matter content for the programs, and the training of a very small cadre of teachers for the rural teacher training schools. The twenty-five agricultural experts who will help staff the travelling educational missions presumably will be agricultural agents under the administrative control of and paid from the budget of the appropriate agricultural agency.

We recommend, therefore, that the education section restrict its participation in this program to paying an established per-capita fee for the cost of training and housekeeping facilities for those university students who are destined to participate in the rural teacher training school program, possibly about Rls. 30,000 per year per student for a cadre of 100 students under instruction in the first three years of the Faculty of Agriculture. This would provide approximately 30 students per year entering the fourth-year option of practical work and apprentice teaching at the rural teacher training schools, while about 25 might elect to stay the second year on full staff status, thus ensuring the corps of 50 teachers estimated necessary to staff the agricultural portions of that program. We recommend that an additional small contribution be made from the education section funds to the Faculty of Agriculture for the purpose of improving and expanding its library and laboratory facilities.

INDUSTRIAL AND VOCATIONAL EDUCATION PROJECT

Iran's supply of skilled labor is currently inadequate. During the period of the Seven Year Plan there will be a sudden and disproportionately heavy expansion of this requirement for skilled labor, both for the construction of new industries and for their operation and maintenance after construction. This will aggravate in an extreme degree an already short supply of the skilled artisan class in many categories of industrial labor. Unless steps are taken to increase the available pool of skilled labor, it may be anticipated that a competitive labor market will develop with a resulting rise in wages; pirating labor will occur; and shortages of skilled labor will delay plant completion and installation of equipment.

It might be argued that all industry in Iran today is suffering from an over-supply of labor. However, it should be noted that the Anglo-Iranian Oil Company is at present in serious need of many categories of labor and is increasing the present training program (itself as large as the Plan Organization's educational budget) by 20 per cent in the next three years.

In view of this situation, we recommend that four programs be undertaken by the education section: the development of a limited stop-gap emergency program for meeting the immediate demands of the first two years, the development of a systematic and continuing co-operative industrial apprenticeship program, the granting of assistance to existing programs for training of the engineering level of technical personnel, and the establishment of a program for the training of clerical and office personnel.

The Stop-gap Emergency Program

There are three fundamentally different types of labor shortage which may be expected to become critical during the first two years of the Seven Year Plan: a shortage of skilled artisans in the construction and building trades, lack of skilled artisans who are capable of installing and operating the equipment in the new industrial plants, and the absence of a general pool of semi-skilled labor from which prospective artisans can be drawn without an excessive wastage rate.

We recommend that the first emergency shortage be met by two methods. The first is the training of construction workers on the job during the first major industrial plant construction projects by the process of grossly over-staffing the minor positions, giving on-the-job instruction by foreign technicians, and charging the cost to the development of that industry. Such a policy results in the rapid creation of a large number of single-skilled workmen and a residue of semi-skilled construction labor after the plant is completed. Its cost is not particularly excessive because the low wages paid unskilled labor are actually less than the unit cost of technical instruction in existing school facilities.

The second method is the establishment of single-skill trade school classes on a temporary basis in existing school buildings, factories, and even in the open air. Such courses could be from six weeks to six months in length and designed to do nothing more than teach one simple construction skill. The teachers for these courses need be only skilled workmen and not highly-trained technicians. The cost might well be a charge on the budget of the education section.

The shortage of skilled operators and maintenance personnel for new industries under construction should be trained in industry by the foreign technical personnel employed by foreign or Iranian contractors. The expense should be borne by the industry as a development cost. This has proven to be the only realistic method of meeting such personnel requirements in other countries having a similar industrial expansion problem where no basically-trained labor pool exists.

Building up a pool of semi-skilled labor should be accomplished by creating a series of short technical courses offered in the existing facilities of the trade schools and honaristans. These courses probably should not be over six months in length and should be given on a part-time basis in order to attract mature persons who are actively earning their living as unskilled labor. Advanced students in the technical schools could be used as instructors and be paid a small stipend. These courses should be more in the nature of a selection process designed to weed out those temperamentally and physically unfit for industrial employment, and thus reduce industrial wastage, rather than as an advanced specialized training. The curriculum should be built around functional literacy, skill with simple tools, ability to read simple instruments, and knowledge of plant procedures. The cost of this might be equally borne by the education section and the budgets of those co-operating organizations which, for example, furnish plant facilities, power, and simple materials.

The Industrial Apprenticeship Training Program

The two most important long-range personnel requirements for industry will be highly-skilled artisans and foremen. Any industry which is going to be efficiently operated and be able to compete in an open market must have these two absolutely essential grades of labor. Both are difficult and expensive to train. Ultimately only long experience in actual plant operation under efficient management can produce such personnel. However, it is possible to cut both the time and the operational losses to a high degree through systematic training.

We therefore recommend that there be established a co-operative program of industrial apprenticeship training, making use of existing technical training facilities, to be paid for originally by the Plan Organization but eventually to be financed by a payroll tax administered by local non-governmental industrial councils. A highly successful prototype exists in the Brazilian Service of Industrial Apprenticeship Training (SENAI) which in six years created 69 modern, beautifully-equipped and excellently-staffed industrial schools. This program is worthy of extended and careful investigation.

We recommend that the program start with a conversion and modernization of the public honaristans either completed or under construction in Ahwaz, Isfahan, Tehran, Meshed, and Tabriz. We estimate that, if operated to full capacity, these schools could accommodate between 5,000 and 6,000 full-time students producing between 1,000 and 1,200 graduates per year. Shop and laboratory equipment should be improved and increased and the curriculum revised in accordance with the industrial needs of the areas as determined by a careful and technically-directed industrial survey and job analysis. Three levels of instruction should be considered: a two year trade school course for the lower levels of industrial artisans; a four year skilled artisan course; and a six year, part-time, course for foremen. Study should be divided approximately equally between theoretical and practical study.

Students should be restricted to apprentices sent from industrial employment, except that during the first two to four years a limited number, not to exceed one half the total enrollment, should be permitted to enter as full-time students and to complete the course in a correspondingly shorter time. As soon as the normal condition of part-time industrial apprentices can be established, the full cost of operating the program should be borne by the payroll tax, and the number of students should be increased by approximately fifty percent. Then all students should be required to spend half their time in industry; they should receive full pay while under instruction; should be under the discipline of their employer rather than of the school authorities; and should be examined and rated as to proficiency by a board composed of representatives of the industrial council, the labor union (if the trade is unionized in the factory), and the faculty of the school.

Proper administration of these and possible future schools of this type is most important if they are to meet the real needs of local industry. It is recommended that for the purposes of this program a number of regional industrial councils should be established with membership elected by industry and with proper representation of small industry. Representatives of the Ministries of Education, National Economy, and Labor, should sit with the councils in an advisory and liaison capacity. Each council should employ a professional and highly skilled educator to direct the program, these educational directors should be granted broad powers to administer funds, select and employ teachers, initiate construction of buildings, purchase equipment, determine programs of study, and arrange for advanced training of the professional staff of the schools. The educational director should be a civil employee of the local council, holding exactly the same relationship to it as does a factory manager to the board of directors of a private corporation. He should be paid a salary sufficient to attract the highest possible level of technical talent.

It is recommended that the initial financing be by contributions from the Ministry of National Economy in the form of transferring existing industrial school facilities and equipment and allocating the current year's budget for these schools to the Plan Organization, and that the operating expenses and immediate improvements in equipment, library facilities, and teaching staff be borne by the education section. At the end of the second year, this support should cease and the operating expenses should be taken over by the industrial councils.

All industries employing 25 persons or more should be charged a payroll tax which initially might be two per cent, to be paid by the employer in support of the training program. Funds should be held locally and administered by the several industrial councils. Where large, highly specialized industries, such as the Iranian State Railways, the Tobacco Monopoly and the Iranian Airways, wish to operate their own schools for the training of their own personnel, this should be permitted provided they make a contribution of, say, one-fifth of the normal payroll tax to the industrial council to cover their share of administrative expenses, and provided they permit periodic inspections by the representatives of the local industrial council or some other appropriate authority. The Anglo-Iranian Oil Company, because of the nature of its present training program, appears to present a special case. Where such an industry can show that it is already spending more than the normal payroll tax on a voluntary educational program, we feel that it might be advisable to exempt such a company from the contribution to the general administrative expenses of the national program. A direct expenditure of a total amounting to less than the normal payroll tax should be considered prima facie evidence that the industry in question is not supplying a standard of apprenticeship training equivalent to that of the co-operative program.

To ensure the gradual growth of a backlog of trained artisans, we recommend that industries having relatively stable labor conditions with little need to train additional skilled artisans be required to accept a number of apprentices or technical students from other schools, equal to ten per cent of their normal employment figure. Such a requirement would make available the indispensable industrial experience which all such technical students should have and which very small industries cannot provide. The two per cent payroll tax, of course, should apply to all industries regardless of whether or not they elect to send apprentice workers for training.

The Engineering Training Program

It is evident that the industrial development contemplated under the Seven Year Plan will impose a severe strain on the facilities of the Faculties of Science and of Engineering and upon the existing honarsara. There are three methods of training men to meet this demand: foreign training, practical work in industry, and study at the two faculties and the honarsara.

We therefore recommend that the individual industries be encouraged to send carefully-selected and experienced members of their technical staffs abroad to study either in foreign universities or in foreign industrial plants. The education section should restrict its assistance to offering technical advice and making available a central administrative service for handling funds abroad, securing admission to foreign universities, evaluating study programs, and arranging for foreign travel.

Existing Iranian industry should be mobilized to give practical experience to technical students under instruction at the faculties and the honarsara through non-salaried employment for short periods under the conditions of relatively stable labor needs mentioned in connection with the apprenticeship program. The cost of developing the original program should be borne by the education section, but the operational costs of such part-time industrial experience thereafter should be charged against the budget of the University.

The laboratories, the technical shops, the libraries, and the teaching staff of the Faculties of Science and Engineering will have to be improved and increased if the anticipated demand is to be met. In part this should be a normal improvement of existing facilities by the University itself. Thus we feel that the University should immediately seek an amount of not less than Rls. 50,000,000 from the national budget to purchase equipment and supplies for the installation of laboratories and shops in the new Faculty of Science. No transfer of existing laboratory and shop equipment from the present location of the Faculty of Science should be permitted, as this would seriously weaken the Higher Teachers College, which should be strengthened at all costs.

In part such improvements should be a direct charge against industry. In order to encourage industry to contribute to the financial support of this vital program to provide it with trained personnel, the education section should offer the incentive of matching all industrial contributions with an equal amount of money. It is conceivable that at some future time this matching process would have to be discontinued or modified, as industry might easily contribute enough to exhaust the Plan Organization funds available, but at least in the beginning of the program it seems desirable to offer a one-to-one matching incentive.

The Clerical Program

Iran is extremely short of qualified office personnel of all categories, the general quality of performance in this field being very low. The experience of other nations has repeatedly demonstrated that women make excellent office workers as typists, secretaries, filing clerks, machine operators, accountants, bookeepers, receptionists, telephone operators, and similar categories. The training of an adequate supply of office personnel will almost certainly require the partial mobilization of Iran's unemployed woman-power. At present this is difficult because of local attitudes. The solution to the problem of popular prejudice against such work may be anticipated in part from the research study recommended earlier in this report and in part by economic pressure and incentives.

We therefore recommend that there be created a series of commercial schools located in major urban areas and in the centers of industrial regions. These schools should be located in the existing buildings of girls' secondary schools and the cost of the program borne by the Ministry of Education, which may deflect to their support present credits for the girl's secondary schools which at present occupy those premises. The education section should co-operate by supplying typewriters, adding machines, filing equipment and other standardized equipment for commercial schools.

TRIBAL EDUCATION PROJECT

It appears essential that an intensive and continuing effort be made to supply the various tribes of Iran with appropriate educational opportunities. At present the information on their needs and how best to meet them is too fragmentary and inaccurate to permit the initiation of any major program with reasonable hope for success. Yet we consider it highly desirable to indicate publicly that this problem is not forgotten nor these people neglected.

We therefore recommend that a substantial credit be set aside for tribal education and that wide publicity be given to the fact that this credit will be expended only for tribal education and only when a definite detailed program has been worked out on the basis of fundamental research. Since the tribespeople, as citizens of Iran, may be presumed to benefit in some measure from the advantages of other parts of the program, the allocation to tribal education need not be in direct proportion to their percentage within the total population. Approximately five per cent of the educational budget should be earmarked for this project.

OVERSEAS SPECIALIZED TRAINING PROJECT

Iran has traditionally sent many students abroad to study, both private citizens using personal funds and public officials financed by the Government. The flow of private students abroad may be expected to continue unless artificially restricted by Governmental order or by a marked fluctuation in foreign exchange. The flow of Government-sponsored students and industry-sponsored technicians will almost certainly increase under the impact of the Seven Year Plan. The foreign training of students is of direct interest to the Government because of the need to develop an adequate source of technical skills needed in private or state-sponsored industry, agriculture and the professions, and a corps of technically-trained administrators competent to direct the execution of the Seven Year Plan, including educational reform.

We therefore recommend that an overseas specialized training project be established to offer four services: co-ordination, travel, educational admissions, and financial aid. The co-ordination should consist of a guidance program for prospective students, including an analysis of the probable future industrial needs for various categories of trainees, a continuing inventory of existing supplies of trained personnel based on the National Roster of Scientific and Technical Personnel, and specific information on available educational institutions abroad. The travel service should include information and assistance in routing, booking hotel and travel accommodations, and the handling of foreign exchange. The educational admissions service should include the rendering of official evaluations of Iranian and foreign educational credentials, translation of Persian and foreign educational records, and assistance in securing academic admission to the universities or schools which are desired.

The financial assistance service will differ widely for four classes of personnel. No financial assistance should be given private students from the Plan Organization's educational budget, and the present custom of granting private students the privilege of purchasing foreign currency on the official exchange rate should be restricted to students whose proposed program of studies coincides with a nationally-needed area of specialization and who submit to official supervision while abroad. There should be no restriction of private individuals who wish to study abroad, but it does not seem desirable to continue the practice of having the Government pay approximately one-half the educational, travel, and living expenses for students who choose to pursue an educational career which has no apparent relationship to the development of the national economy.

The same policy should be applied to technical personnel sent abroad by private industrial firms. The training abroad of industrial technicians should be encouraged, but should be paid for by the benefiting industry and charged as a cost. Only when the proposed training coincides with the national effort, and is of a level which is acceptable to the Plan Organization, should exchange be granted at the official rate.

Obviously, the cost of overseas training of Iranian personnel required by divisions of the Plan Organization other than the Educational Section should be charged to their respective budgets. Full financial and administrative responsibility for the training of technicians to staff the education program, to assist in the decentralization and development of the educational system, and to fill certain critical educational needs caused by the marked growth of schools which may be anticipated under the Seven Year Plan, however, should be vested in the educational section.

All overseas specialized training in education should be restricted to the university level; only candidates with at least three years' experience in the educational system as a teacher or as an administrator in the field should be selected. They should have a working knowledge of English, and only persons with a licentiate from the University or an equivalent foreign degree should be sent abroad, selection being made on the basis of competition with at least one foreign advisor familiar with educational conditions in the country to be visited serving on the selection board. It should be noted that this recommendation for the training of technical personnel for the administration of the education program should not be interpreted as in any way restricting the foreign training of technicians sent abroad and financed by other sections of the Plan Organization or by other appropriate Government agencies.

We recommend that the students be required to follow a course in the general field of specialization determined by the selection board. Thus, a student employed in a rural teacher training school might study agriculture, rural sociology, or curriculum construction, but should not be permitted to take some totally unrelated subject merely because of personal interest or the possibility of getting a degree which would have economic value upon return to Iran. The period of study abroad should be looked upon as professional preparation for specific employment in Iran; official students therefore should be continued on full salary while abroad and their tenure privileges continued without interruption.

The period of study abroad should be not less than one calendar year nor more than two and one-half calendar years. This recommendation is made as less than one year is inadvisable because of the period of adjustment required abroad and the high percentage of the cost represented by travel expense. Longer than two and one-half years is considered undesirable because the student loses contact with the reality of his position in Iran. If a university student enters with full advanced standing, he may aspire to a doctorate in two and one-half years of full-time intensive effort. If he enters with less than full advanced standing, the extended period makes possible completion of a master's degree, but does not encourage him to go on to a hypothetical doctorate which would certainly involve far too long a period to be considered a professional investment by his Government.

Approximately 100 well-qualified educational specialists should be encouraged to take a doctorate in their field during the Plan period and approximately 250 well-qualified educators should be encouraged to take the master's degree. It should be emphasized that while all students being trained abroad should be encouraged to attempt to secure an advanced degree, partly for prestige reasons and partly because this ensures coherence and organization in their work, the measure of whether or not a student has successfully occupied his time abroad should definitely not be whether he received a foreign degree, but whether he took appropriate courses and made a high record in his work.

It is recommended that the Dean and all department heads of the Higher Teachers College, that the ostan directors of education, that the directors of all secondary level teacher training schools, and that the directors of education in the twenty major cities be appointed only from candidates who have had educational training abroad in a decentralized system.

TEACHER TRAINING PROJECT

Iran has a shortage of good teachers, but fortunately possesses a large teaching group who might be good teachers if they had ever had an opportunity to learn. If an educational system has good teachers it can fail in almost every other respect and still make a creditable showing. If it has poor teachers, the finest educational system with the most ample budget is inevitably going to fail. We therefore recommend that a teacher training project be initiated by the education section to prepare this new group of teachers, partly through re-training the existing teacher group and partly by training young people who have not yet worked in the present system. This project should include four programs: an in-service training program required of all teachers, summer vacation training courses, secondary level teacher training courses, and the Higher Teachers College.

In-Service Training Program

We recommend that classes in educational practices and theory be organized in individual schools, employing standardized syllabuses prepared by the research and planning project of the educational section, and that attendance be compulsory. The leader of the discussion group should be the director of the school. Occasional visits to a municipality should be made by teams from the ostan capital or from Tehran to work with the teachers and to explain details of the new organization and methods. A small working library of technical books on education should be made available to every school above the elementary level and in all major urban elementary schools. It might well serve as a nucleus to which annual additions should be made. The cost of such a unit is approximately Rls. 1,950, at the official rate, delivered in Tehran. A brief bibliography of selected reference books in education has been prepared and is given in Exhibit B-21.

We recommend that the following should be organized periodically in the larger urban centers: demonstration classes, visits to noteworthy schools, and teacher "work-shop" meetings of from three days to a week in length. In these "workshops" a single educational problem, such as the preparation of a study unit in one of the social studies fields, should be intensively studied, solved, and the solution tried out on an experimental class. The period of compulsory attendance at such in-service teachers' training projects should be terminated as soon as possible. It will be necessary to enforce compulsory attendance at the beginning because of the urgency of the reform, but this should soon give way to voluntary attendance encouraged by the quality of the offering and possibly by financial incentives.

Summer Vacation Training Courses

Each ostan should organize annual training courses for elementary school teachers during the summer vacation, to be staffed by outstanding educational officials and university professors. The location of such courses should be carefully planned so that they are near large centers of population yet are in the most pleasant climate available to that area, possibly at a camp in the mountains. A similar but much more elaborate course should be offered to secondary and teacher training school teachers near Tehran.

Sessions of from two weeks to one month duration are recommended. The work should be practical and the daily program such that there is ample opportunity for carefully-planned recreation which should be an official part of the program. Major emphasis should be placed on the exchange of ideas between teachers from different localities, and careful group consideration of problems under the direction of a skillful leader who has prestige, has been trained in education, and who is thoroughly familiar with the new orientation planned in the projected reform.

Such a period of vacation study can be built up into the most interesting period in an otherwise rather bleak year of routine teaching. It should be entirely voluntary, but it can be made highly attractive with a carefully-prepared recreation program and the offering of incentives in the form of a small financial bonus for all teachers who attend and successfully complete the work.

Secondary Level Teacher Training Schools

The creation of rural teacher training schools has already been recommended and the general details have been outlined earlier in this report. The existing secondary level teacher training schools, normal schools for the preparation of elementary school teachers, should be continued, but their programs should be radically modified to meet the needs of the proposed new educational system. Each school should be headed by a director who has had the opportunity of studying a decentralized education system at first hand. The directors of these schools will have tremendous influence upon the school system for the next two generations, through the elementary school teachers trained under them, and it is therefore essential that they be accurate and enthusiastic interpreters of the new system.

Since virtually the only source of technical information on decentralized education is in the English language, English will have to be made the required foreign language in the curriculum of such schools, and a readily-accessible technical library of English and American titles will have to be established in each school.

We therefore recommend that the directors of the existing normal schools be selected solely from among candidates who have had professional education in a country which has the decentralized system, preferably in England or the United States, and that the present incumbents, if they can meet the language and educational prerequisites, be given first priority for training abroad under the Overseas Specialized Training Project. If the latter are unable to meet these requirements or are unwilling to go abroad, they should be given the option of shifting to another position with no loss in pay or tenure, or of being put on the disposability list as a device for lessening the inevitable loss.

A substantial grant should be made to improve the libraries and laboratories of these schools, and financial incentive should be offered in the form of a matching fund to encourage local investments in adequate modern plant facilities so as to attract the highest type of student.

The Higher Teachers College

Education in Iran can progress only if there is a continuing source of educational research and of highly-trained educational specialists. It is a very serious mistake to consider that high professional qualifications in one field prepare a man to be an educational administrator or research worker. One of the major causes of the educational failure in Iran has been the fact that its educational structure was dictated largely by lawyers and physicians rather than trained educators.

The existing institution for the preparation of educational specialists is the Higher Teachers College. Unfortunately it has deteriorated seriously in the past decade and today is a subordinate part of the University. We therefore recommend that every effort possible be made to increase the prestige, technical equipment, quality of teaching personnel, physical plant, and program of instruction of the Higher Teachers College. Both the Faculty of Arts and Literature and the Faculty of Science should be transferred from its campus at the earliest opportunity, but no library, laboratory, or shop equipment should be removed. The Higher Teachers College should retain its affiliation with the University but should be raised to a full faculty status, to be known as the Faculty of Education, and should be authorized to grant a degree of Doctor of Education.

The director should be a senior Dean of the University. He should be a mature scholar with extended foreign study in a country having a decentralized educational system, and should hold a doctoral degree in some area of professional education. All department heads in the reorganized school should be men with foreign educational training in a country having a decentralized system, and should hold either a master's or a doctor's degree. The library should be greatly strengthened and developed around a core of American and English technical books in education and should be accurately and systematically catalogued and indexed according to a standard system, preferably either the present Dewey Duodecimal or Library of Congress system. English should be made the required foreign language. Advanced students should be given every possible opportunity to assist in educational research and should be used as fully as possible, in return for a modest stipend, in the various educational programs of the Plan Organization.

THE EDUCATIONAL INCENTIVES PROJECT

The educational requirements of Iran can never be met solely by expenditures of central Government funds, unless the education budget becomes the largest item of national expenditure, possibly larger than all the other items combined. Such an eventuality would be obviously impracticable. However, the people of Iran, in common with other forward-looking nations, are willing to expend substantial funds for the development of an adequate educational system. The matter, therefore, becomes one of finding the best methods for crystallizing this willingness into practical financial support of sufficient magnitude. A method employed most effectively in modern decentralized education is to provide incentives to encourage people to invest their money in formal education rather than to waste it in haphazard and non-productive efforts. The most obvious of such potential sources is that of private philanthropy, which is already bearing a heavy share of the costs of even formal governmental education through the contributions of the Pious Foundations. But there are other and less well recognized sources. If the educational needs of Iran are to be met, these must be mobilized.

We therefore recommend that an educational incentives project be initiated for the purpose of encouraging increased and systematic local educational expenditures, and of stimulating the development of a higher degree of quality within the formal educational system.

The funds allocated to this project should be carefully expended in the form of prizes for research and professional competitions; for competitive scholarships to encourage gifted people to develop their talent; in matching local expenditures for the purchase of school equipment and construction of buildings to replace rented ones; in guaranteeing loans during the period a local school committee is amortizing a capital investment; in offering incentives to teachers to continue their education while actively teaching, and to encourage them to accept employment in localities where living conditions are not attractive; and in offering incentives to enable young people to enter service professions where the financial remuneration is not attractive.

RECOMMENDED METHODS OF IMPLEMENTING THE PROGRAM

The success of the several projects recommended in this report, and of the entire educational portion of the Seven Year Plan, depends to a major degree upon the methods employed for putting them into effect. This involves even more the spirit and viewpoint with which the program is undertaken than it does routine questions of operating efficiency. If the development of a modern decentralized and flexible system of education is to be accomplished, and if the specific projects recommended in connection with the Seven Year Plan Program are to be successful, it is essential that individual and local initiative be actually aided and encouraged, not merely rendered lip-service.

This will require a radical readjustment of thinking as well as of methods. There is no use, for example, in allowing one bureau to exercise broad initiative in the hope that new procedures will be developed which then can be hopefully forced upon other bureaus, a practice actually attempted by one high official. Such a procedure merely shifts the power to make decisions to one isolated bureau and leaves the main uniform, stereotyped and highly authoritarian structure undisturbed. Only if teachers, local educational officials, and the lay public are actually given the opportunity to seek their own solutions, and to make their own mistakes, can the technique of decentralized educational control work successfully.

Building this spirit and practice is not a speedy process, but it is the only sound one. A good deal of patience may be required at times, and the temptation to force solutions by sheer exercise of authority must be rigorously resisted. The Government, for example, must be very careful not to conclude that the whole process has been a failure the first time there is an obvious failure in local control, and to reestablish the old authoritarian methods. Such failures are inevitable. But they are more than offset by the many effective and improved solutions of educational problems which equally inevitably result over a period of time from the exercise of individual and local initiative. Likewise, the cost of these few local failures, both in rials and in delay, is infinitely smaller than the price exacted by the impediments to progress which are inherent in the present educational system.

We therefore recommend that the several educational projects be initiated by means of an administrative technique which is consciously and specifically democratic in type and decentralized in procedure. It should be a co-operative effort of four groups: the education section of the Plan Organization, the Ministry of Education, local community organizations, and foreign technical advisors.

PLAN ORGANIZATION PARTICIPATION

We recommend that the education section of the Plan Organization be very small, efficient, and fluid in its organization. It should be composed of persons who are of outstanding professional competence, generally respected both personally and professionally, and are wholeheartedly committed to the success of the Seven Year Plan educational program.

Only if the education section is small can the administrative personnel know each other intimately and work together in the informal but highly effective way which is possible when every member knows at first hand the ideas, strengths and weaknesses of his fellow members. A small organization reduces the overhead cost of administering the educational program, and can be an object lesson to other Government organizations in education as to what can be accomplished with limited but carefully selected and trained personnel.

The education section should be efficient, partly to cut the costs of administration and partly to serve as a model for other and subordinate organizations. But it also must be efficient for a far more fundamental reason. Regardless of the degree of initiative allowed to individuals and local units, a certain measure of basic administrative control is indispensable to good management. But whereas Iran carries detailed supervision to deadly excess, it is equally weak in basic administrative organization and procedures. Cost accounting, or indeed any systematic record keeping, can hardly be said to exist. Budgetary control is weak, utterly unscientific and ineffective. Personnel control, in an administrative sense, is so poor that even deans of faculties can not accurately determine the manpower available to them. It is essential, therefore, that the education section of the Plan Organization make itself a model of administrative efficiency in order to demonstrate what can be accomplished by modern methods. We accordingly recommend that the education section adopt a standard modern business filing system and a simple machine accounting system, and that its office procedures be organized by a skilled foreign office manager.

Moreover, the education section should be kept fluid and should not be permitted to become an unwieldy bureaucratic organization which cannot quickly be reorganized to handle new problems. The program of recommended projects is such that great flexibility is an absolute essential. As certain projects are completed and new projects begun, the section's personnel requirements will change materially. It would be a serious mistake, therefore, if the section could not quickly and efficiently alter personnel and reorganize its internal administration to meet the needs of the moment.

We therefore recommend that the education section be started with no more staff than required for the basic administration of the program, plus that needed for the planning and fundamental research project. The administration should consist of: the Manager of Education and Training and his personal assistants; an honorary advisory committee composed of distinguised Iranian educators serving without compensation; and office staff for personnel, correspondence, translation and budget control.

We recommend that the general administrative group be set up and the nucleus of supervisory and technical personnel be enlisted as rapidly as trained personnel becomes available, gradually expanding as the need arises into a maximum of five sub-sections under supervisors to handle the ten principal functions as follows:

1. Research and planning.
2. Industrial and vocational education.
3. Rural and agricultural education.
    a. Health and physical education.
    b. Tribal education.
4. Adult, extension and non-school education.
    a. Mass education media.
    b. Women's education.
5. Teacher training.
    a. Overseas training.

It is expected that the supervisor will have complete detailed direction of the activities indicated in the sub-section title and only general direction of the other activities listed under that title. Some of these activities will remain relatively small; the health and physical education probably should not require more than one or two liaison officials working with the public health section to integrate the two programs. The tribal and women's education activities will not commence until the remaining program is relatively well advanced.

Finally, we recommend that this organization should progressively be merged with the Ministry of Education on a basis of parity so that at the completion of the Seven Year Plan a single, small, efficient and predominantly technical and advisory national educational organization would remain.

With regard to the general direction of the program, we recommend that the permanent incumbent in any key position should possess the following minimum qualifications: he should be a respected member of the education profession although not necessarily famous or politically prominent; he should have first-hand knowledge of modern western education, preferably through extended study in the United States; he should possess a graduate university degree of recognized status, preferably a doctorate; he should speak and read English with fair facility; and he should have had a minimum of five years of practical experience in the educational system of Iran. Such key positions should include, but not be limited to, the post of Manager, the assistant manager, the various sub-section chiefs in the education section of the Plan Organization, ostan educational director, the deans of the various faculties co-operating with the Seven Year Plan, the Director of the Higher Teachers College, the directors of all technical schools, secondary teacher training schools (including the proposed secondary rural teacher training schools), and the director of any research project.

It is certain that in the beginning there will not be enough qualified Iranian personnel to fill all of these positions. We therefore recommend that, where necessary, foreign technical advisors be used temporarily as consultants. Highly qualified Iranians who fail to meet some of the education requirements should be encouraged to repair the deficiency while on full pay, with the prospect of being appointed to a specific position. In addition, a large number of able younger men and women who have clearly demonstrated professional promise in practical educational work after graduation from Iranian universities should be sent abroad for specialized training.

Every effort also should be made to mobolize the other Government agencies and local educational resources. Only with their sincere co-operation will it be possible to implement most of the recommended projects, because of the limited funds available to the Plan Organization for education and, even more important, because all of the projects are in essence services designed to supplement and improve existing educational offerings. The most important of the Governmental groups is, of course, the Ministry of Education.

MINISTRY OF EDUCATION PARTICIPATION

The Ministry of Education is clearly concerned with all educational efforts in Iran, regardless of whether they now operate under the administration of another Ministry. This interest will be intensified rather than lessened under the Seven Year Plan.

The existing school system will be the foundation for all development programs and educational projects. This school system, modernized and strengthened along lines previously indicated, will supply the pool of educated and partially-trained personnel which must be drawn upon for trainees in the specialized programs of the Seven Year Plan. The importance, therefore, of achieving full, sincere, and friendly co-operation from the Ministry of Education cannot be over-emphasized. Fortunately there is every reason to believe that the key officials of the Ministry are ready and anxious to co-operate in the program. The technical Director General has been consulted at every step in the process of this study.

The Ministry of Education will have a direct, immediate and prominent part in the program in three areas in the school reform; in the decentralization of administrative control; in teacher training; and in the foreign training program. The details of these recommended projects have been presented in the preceding section of this report. The participation of the Ministry is obvious. The schools can be modernized, programs improved, teachers properly trained, and sufficient students can be sent abroad for specialized training only if the Ministry co-operates in policy, administration and budget.

The vital project of progressive decentralization of administrative control is impossible without the Ministry's consent, participation and wholehearted co-operation. This will require a very real sacrifice of a certain amount of existing authority, but it should be more than compensated by the growth and material improvement of Iran's educational system and by the gain in prestige which is certain to accrue therefrom.

We therefore recommend that the offices of the Minister of Education and of the Technical Director General of the Ministry of Education be permanently represented on the Educational Advisory Board. In addition, it is suggested that certain outstanding educators who occupy posts in the Ministry should be invited, upon the discretion of the Director of Agriculture and Social Services, to become permanent members of the Advisory Board.

Officials from the Ministry of Education who possess the required high technical and professional qualifications should be offered important posts in the administration of the education section and their temporary release from active service with the Ministry should be arranged. If carried out in a careful and sympathetic manner, such a policy might well be the method by which an eventual merger of the two agencies could take place. It should be emphatically stated, however, that this recommendation is made with the understanding that the invitation of Ministry personnel to serve in posts in the organization of the education section should be entirely dependent upon the wishes of the Director of the education section and upon the technical qualifications of the Ministry personnel to fit into the new program. Any attempt to bring pressure upon the Director to give key posts to persons who are not technically qualified, or who are not temperamentally or professionally fitted to work with the administrative team which the Director is to create, would be a most serious mistake and might well defeat the entire educational program.

COMMUNITY PARTICIPATION

Most, but not all, of the ostans and shahrestans have educational councils composed of local school officials and prominent laymen. But the majority of these councils have had little opportunity in the past to exercise any real administrative or policy discretion, with the result that their interest is mild and their tendency is to shift the full responsibility for all decisions to the educational director and to become little more than a rubber stamp for his administrative policy. A few parent-teacher organizations (The Co-operative Society of Home and School) have been organized in individual schools, but practically none of them has any contact with the schools other than to attend festivals or hold semi-social meetings in honor of cultural events. Their influences on school policy is negligible. Their apathy must be overcome and their active participation in the program must be enlisted if the educational portion of the Seven Year Plan is to succeed.

We therefore recommend that community participation in the educational projects of the Seven Year Plan be encouraged by every means. Specifically, we recommend that this participation be fostered by: informing the people of the educational needs, convincing them of their own personal responsibility to meet these needs, crystallizing their ideas and desires into a concrete program of action, making possible the legal channels for such action, and by continuously following up and guiding their participation in the program.

The people must be informed of the educational needs. It is unrealistic to expect the layman to recognize and analyze educational deficiencies unless given professional guidance. The process of informing the public should make use of every possible channel of mass education media. Accurate and detailed articles should be written in the daily press. Radio programs should be broadcast which will inform the parents of what is going on in the school system; at an advanced stage in this technique it might be wise to broadcast actual unrehearsed classroom situations with a running explanation by a skilled educator from the education section. Public forums should be organized in which the problems are fully aired and various technical experts are questioned from the floor as to possible solutions. Most important of all, parent-teacher associations should be organized which really function, and which gather to investigate and to discuss in detail the problems of specific schools.

Such public information will not be successful unless guided by persons who know intimately the operation of the types of programs recommended for adoption. It is recommended, therefore, that small teams of two or three technicians from the education section be sent to the ostans and shahrestans to meet with the local educational councils, teachers groups, public forums and parent-teachers associations to help focus their attention upon the basic problems which exist.

The people must be convinced that the workable solution exists and is within their power to adopt. The most potent instrument which can be used to convince the people is the offering of financial incentives such as matching funds to encourage them to work for and to put money into projects of proven worth. Such financial incentives should not be flat grants from Government which rob the people of all participation and hence interest, but tokens of the Government's sincere interest and desire to help solve the problem if the people themselves really want to solve it.

There are other techniques for convincing the people; for example, demonstrations of outstanding educational methods in the best schools in the district. If a parent from a very inferior school is invited to attend a very superior school to watch the educational service which more fortunate children receive, he may be awakened to the deficiencies in the program offered his own child, and may determine to take active steps to correct the situation. Many people of wealth and prominent position in their communities who are at present uninterested in the educational problems may be convinced that such problems have direct bearing upon their own personal lives and their own financial interests.

The ideas of the general public must be crystallized. Parents must be helped to perceive that they have a responsibility themselves to correct unsatisfactory educational situations. This is the crucial point in the entire program. If people are unwilling to work and to make sacrifices for a better education for their children, no amount of Government reforms and private philanthropic grants will have much effect upon the situation. People must be guided into embarking upon concrete reforms of their own—not through force but through being honestly convinced that such reforms are desirable.

The technique which is recommended for achieving this end is that of extended technical conferences with the local educational councils. But no intermittent contact with the education section will be very effective in developing this local initiative unless it is aided by the constant influence of a very competent ostan or municipal director of education. These men must be able to translate into concrete projects the awakening interest but relatively unformed ideas of the public.

Legal channels for accomplishing these projects must be opened to the local communities. In part this will result from the gradual decentralization of educational authority and the increased autonomy and administrative authority of the local educational councils and the director of education in ostans and municipalities. But there will have to be some fairly basic legal reforms instituted or the program will quickly bog down. The full details of such legal reforms can come only from the continued research of the legal and administrative group in the research and planning sub-section. A typical example, however, might be the development of a workable law of eminent domain to permit a school to acquire property when needed for public use without paying the fantastic prices which speculators demand as soon as they recognize the need for a particular plot of land. Similarly there should be some legal protection granted to the public in cases where a school has been constructed on lands belonging to a Pious Foundation, in the event the trustee decides to reverse an earlier policy with regard to its use for educational ends.

Finally, the educational efforts of the general public must receive constant guidance and supervision. The whole plan of decentralization is based upon the fundamental policy that people shall make their own decisions. But it is unrealistic to expect local authorities, usually having only limited resources of technical talent to meet all problems unless given guidance and technical assistance from some organization which possesses the talent. In part this technical assistance will come from the education section and co-operating national agencies, but in a considerable measure it will be necessary to draw upon the resources of foreign technicians.

FOREIGN TECHNICAL PARTICIPATION

There are three sources of foreign technical assistance: imported libraries of technical books; the training of Iranian personnel in foreign educational systems; and the evaluation, consultation, and supervision of foreign technicians employed on contract to work in Iran.

The danger of recommending the purchase of foreign technical books on education for distribution to the schools is very apparent. In the past such imported libraries have not been used or, when used, have been considered a foreign model to be slavishly copied in all details. Nevertheless, it is essential that the teachers and officials of Iran have access to authoritative information on the types of educational projects recommended in this report. Since such information exists only in foreign publications, we recommend their importation in spite of an acknowledged danger of misuse. Three levels of technical libraries should be imported for the schools of Iran: a unit package of approximately fifteen (with annual additions of five) fundamental books on education which should become standard equipment in every secondary school for the use of the teachers; a technical library of approximately 500 (with annual additions of 100) books which should be located in the educational departments of every ostan capital, every city of over 50,000 inhabitants, in the proposed rural teacher training schools, the existing secondary level teacher training schools, and in the secondary level technical schools; and research libraries in the faculties of the two universities, in the Higher Teachers College, and in responsible research groups.

To insure that students and teachers will have full opportunity to use the new libraries the creation of a modern technical library service is recommended. This can be done only through the importation of foreign personnel to assist in reorganizing the important libraries, to advise on the exceedingly technical operations of setting up a modern classification system, and to train professional librarians for the main educational institutions of Iran. One or more trained librarians with intimate knowledge of technical, and particularly educational, libraries in the English language should be brought to Iran on contract as consultants in this field.

A detailed recommendation of the overseas specialized training of Iranian personnel has already been presented and need not be repeated here.

The importation of foreign specialists on contract appears to be absolutely essential if the recommended program is to be successfully carried out. But as a matter of policy, this foreign technical assistance should not be greater nor extended for a longer period than is necessary. Specific decisions as to the number of such foreign technicians, their type, and the duration of contract, might well be delayed until a systematic study has been carried out to determine exactly what Iranian talent is available, and in any event will have to be modified from time to time as the program progresses.

It appears highly probable, however, that four types of technical assistance will be necessary: a policy-level consultant, a full-time administrative consultant, a group of technical consultants who will be concerned with specific portions of the program, and a limited number of consultants for individual key schools.

A policy-level consultant in education should be brought to Iran each year to assist in evaluation of the program and to advise on all matters involving any basic shift in educational policy. This consultant should be an active and prominent participant in current world educational developments and should be thoroughly familiar with a decentralized system, preferably that of the United States. He should have wide acquaintanceship with other educational systems of the world and should be familiar with social and educational conditions in Iran. It seems desirable to have this consultant brought to Iran periodically rather than held in Iran on permanent contract. If the staffing of institutions in other countries and in the educational systems of the occupations of Japan and Germany may be taken as evidence, it seems highly improbable that top-level educational personnel will be willing to absent themselves from the United States or the British Commonwealth for so long a period as the full seven years of the Plan. We accordingly recommend that all foreign educational personnel—where the highest quality is necessary—be contracted for on relatively short term bases.

A full-time administrative consultant should be brought to Iran for the early years of the program to remain for as long a period as his services are required. He should have extended experience in practical school administration, preferably as a secondary school principal and city school superintendent in an American city of between 50,000 and 1,000,000 population, should be thoroughly familiar with standard office procedures, and should possess a graduate university degree in education. This administrative consultant should be a practical educator and administrator able to take the outlined policy and show how to put it into effect. He should not be considered a policy adviser. Any fundamental policy revision should be made by the Iranian Manager of the education section, after consultation with the Iranian Educational Advisory Board and with the foreign policy-level consultant.

The administrative consultant, though not primarily a policy advisor, should hold one of the most important positions in the organization, not only advising on all important elements of general administrative procedure but also acting as a principal advisor in all matter pertaining to the educational budget under the Seven Year Plan, aiding the Iranian Manager with the relatively unfamiliar details of modern educational budgetary practices and strengthening his hand in resisting any pressure to divert funds to projects other than those to the best interest of the program.

The technical consultants should be employed on contracts of from one to three years' duration, renewable up to the duration of the Seven Year Plan. They should be thoroughly familiar with the particular educational specialty they are to direct, and should hold the doctoral degree. They should have had practical experience in modern education, preferably in universities or in research or testing agencies of the United States or England. These consultants should not be considered policy advisors except within the area of their own specialty. One of their responsibilities should be the practical training of Iranian educators, chosen from competent persons who have already received their theoretical training abroad, to replace them.

It is recommended that a limited number of practical foreign technicians, both school directors and specialized technical teachers, be employed on contracts varying from one year to the duration of the Plan. These technicians should have extended experience in their field of specialization, and in general should hold a university degree. These foreign technicians should be considered practical directors of educational programs in schools.

PERSONNEL FOR THE EDUCATION SECTION

Personnel requirements for the education section will vary with the demands of the program. At the peak, when all the activities previously listed are fully staffed, the section should be composed of a manager and assistant manager, five supervisors, eight or ten unit chiefs, thirty or forty technical assistants, and the necessary clerical and secretarial staff. The majority of those of unit chief or higher rank will need foreign consultant aids to advise on administration and technical problems and to train the incumbent to take over full control. Length of service of the consultants will vary, each case depending on the complexity of the technical problems involved and the rapidity of satisfactory training of the permanent personnel.

PERSONNEL FOR TRAINING OTHER PERSONNEL

The two main personnel demands will be in the fields of agriculture and industry. To supply these two demands there must be procured adequately-trained personnel with which to staff or to supplement the existing staffs of the schools which will produce the needed artisans and technicians.

There are three levels of trained personnel required in the agricultural education project of the Seven Year Plan: persons trained for work as instructors in the secondary level rural teacher training schools, persons trained to be the agricultural experts who accompany the travelling education missions, and university level agriculturalists trained for the program of the agricultural section. We recommend that the teacher-pupil ratio in the secondary level rural teacher training schools be not greater than one to twenty-five. At the peak load of these schools, there would be 10 institutions enrolling an average of 320 students each, requiring a total teaching staff of 130 instructors. We therefore recommend that these schools in the aggregate be staffed with 10 directors trained as agriculturalists; 10 assistant directors trained as educators; 40 agriculturalists, representing an annual supply from the Faculty of Agriculture at Karaj; 80 teachers, preferably graduates of the recommended Faculty of Education; 10 librarians; 20 cooks and bakers; and 10 custodians. The majority of the work in operating the physical plant of the schools should be done by the students.

For the travelling education missions, we recommend that the following aggregate personnel be procured: 25 agriculturalists, graduates of the Faculty of Agriculture at Karaj; 25 teachers trained in anti-illiteracy methods and in handicrafts; 25 sanitarians trained in simple public health procedures; and 25 drivers and projection equipment operators. To produce this initial and continuing supply of trained agriculturalists and to supply the program of the agricultural section, it will be necessary to increase the size of the Faculty of Agriculture at Karaj. We estimate that the demand can be met with an annual graduation of between 100 and 125 students. Since we recommend that the existing program be lengthened to four years and that the faculty members become full-time instead of part-time professors and instructors, it follows that the existing teaching staff must be increased considerably.

A full-time professor who is expected to do research and to devote a considerable portion of his time to student guidance should not be required to have a weekly teaching load of more than eight hours on the average. Highly technical schools such as the Faculty of Agriculture should have a professor-student ratio of approximately one to ten. We recommend, therefore, that the active teaching staff of the Faculty of Agriculture be increased to a number of full-time professors, assistant professors, and instructors sufficient to approximate this recommended professor-student ratio. The actual increase which this represents over the existing staff is difficult at this time to estimate because the present university practice is such that so-called "full-time" professors are not actually used to their full capacity, nor required to spend their normal working day outside of the actual class-room hours in professional work of the Faculty.

The staffing of the industrial and vocational training program is a much more difficult problem. Industrial labor is recruited very largely locally, since there is no real geographical mobility in Iran except a slow flow towards urban areas and a marked flow toward Tehran. It accordingly is impossible to predict on a national basis the required number of trainees or the required instructional staff until the locations of industries have been definitely decided. Emergency classes should be established in the locality where any particular industry is to be set up as soon as the locality is decided. Since industry in general will be located where there is an adequate supply of labor, it is possible to predict that there might be a demand for a semi-skilled labor pool in each of the major population centers. Certain centers may be eliminated for practical considerations. Abadan and Ahwaz have already employed intensive recruitment and training programs for some years because of the disproportionately large labor requirements of the Anglo-Iranian Oil Company. Rezaiyeh anticipates only a small industrial development, probably in sugar processing, because of its predominantly agricultural situation. Pahlevi is sufficiently close to Resht to draw upon labor trained there. Kazvin is in the labor area of Tehran. Ardebil seems unlikely to develop into a major industrial center because it is a frontier town. In the remaining major cities, honaristans, or technical schools exist in Shiraz, Isfahan, Tabriz, Meshed, and Tehran. This leaves Resht, Hamadan, Kermanshah, Yezd and Kerman with no formal industrial training program.

A second problem is that of diversified training. Modern industry requires an almost infinite variety of specialized skills. The categories of specialized skills required by

American war industry, for example, in only those areas contemplated under the Iranian Seven Year Plan, numbered something over five hundred. It is clearly evident that no educational system based on formal schools could possibly give adequate training in so diversified fields. All industrial nations, Great Britain and the United States included, train the majority of their skilled personnel in industry itself. In a country without an adequate skilled labor pool, the training of the operational personnel takes place during the construction and installation of the plant, and the maintenance personnel during the operation of the plant. Both costs are borne directly by industry as a cost of development and of production. The development of the Allied truck route to Russia with war supplies during the Second World War and the construction of roads and railroads in Iran has left a large hidden labor supply trained in these operations.

The main immediate labor bottleneck appears to be in the field of construction. In small local areas there is probably a sufficient supply of indifferently trained but relatively experienced construction labor to handle proposed small-scale construction. In large urban centers and in localities where major building projects are contemplated there will be a serious shortage, a shortage which, in fact, exists at present. In the development of major industrial plants and large housing projects, the training of the labor should largely be handled as has been indicated with regard to industry, and upon the completion of major projects this labor will be added to the available trained labor pool for subsequent projects.

To meet the serious initial demand of construction labor and to meet the continuing demand of skilled personnel for industries three levels of training will be required: a stop-gap training program for semi-skilled labor, a secondary-level technical training school program, and a university-level technician and engineer training program. To meet the educational demands of these training programs, it is recommended that the following teaching personnel be procured.

For this stop-gap program it is estimated that in ten major cities there should be an average of 1,000 men trained, making a total of 10,000 distributed over the country according to the needs of the projected construction program. Based upon the standard instructor-trainee ratio of one to fifteen, and calculating that the training period will be for six months' duration and repeated four times in the first two years, we recommend that 165 instructors in the fields of electric wiring, plumbing, pipe fitting, carpentry, masonry, plastering, glazing and painting will be needed. This averages approximately 20 instructors in each category. It is not anticipated that there will be any major difficulty in securing this number from existing Iranian personnel.

For the honaristan or secondary-level technical training schools which are to be converted to industrial apprenticeship institutions, it is calculated that the existing six institutions (when present construction is completed in Tabriz and Ahwaz) will be able to handle a total of 6,000 students at maximum capacity through the device of staggering the class schedules. If the present six year program were continued there would be an annual production of 1,000 graduates less the current attrition rate (which differs in different parts of the country but which nowhere surpasses 20 per cent) or approximately 800. Because of the possibility of combining several programs of varying lengths, this figure could be increased to a maximum of 2,500 graduates of the short course each year. Whatever may be the distribution of students within the several programs, it is estimated that there will be need for approximately 200 full-time technical instructors who have been trained in honarsaras, in the Faculty of Technology, or in some industrial plant offering approximately equivalent training, and there will be an added need for approximately 100 teachers of classroom and theoretical subjects. These estimates are based upon the capacity program which cannot be reached in less than three years' time. It appears, therefore, that there will be an annual demand for approximately 70 technical instructors and 35 class room teachers each year until the plan reaches its peak. The class room teachers are available. The bottleneck will probably be in procuring satisfactory technical instructors.

The greatest strain will come upon the Tehran University through its two Faculties of Science and of Engineering. To meet the demand for graduates to teach in the technical schools alone there will have to be an annual production of not less than 70 qualified technicians. This, at the standard professor-student ratio of one to ten for technical universities, would require the addition of seven full-time professors to the University staff. The demands from private industry and other projects to be developed cannot be estimated until the exact needs are known. The ratio noted above should serve as a guide to future staffing. It appears almost certain, however, that these needs will be sufficiently great, and the technical demands will be sufficiently specialized, so that the Iranian population cannot possibly supply the needed professors from within its present supply of adequately-trained personnel. Thus, the staffing of the technical faculties of the University will almost certainly have to be accomplished by procuring foreign professors under contract.

A RECOMMENDED TIME SCHEDULE

It is obviously impossible to initiate or to bring to maximum operation all of the recommended projects at the same time. It seems desirable, therefore, to indicate within broad limits an approximate order of priorities in the implementation of the program. The following schedule is recommended:

First Year

1. Organize the administration of the education section of the Plan Organization and establish a standard office procedure.
2. Organize the planning and research sub-section.
3. Conduct the program on setting up a roster of scientific and technical personnel.
4. Conduct the competition for the first group of trainees to be sent abroad for specialized education.
5. Bring to Iran under contract the first group of foreign technical advisors. This first group should include the foreign administrative consultant and the five technical consultants for the research and planning project.
6. Import the basic technical libraries of the first two categories.
7. Bring a foreign librarian to organize the library service of Iran.
8. Initiate the stop-gap semi-skilled labor training program.
9. Start construction on the rural teacher training schools. Put into operation the first three at Rezaiyeh, Sari and Fariman if those existing facilities are made available at no cost to the Seven Year Plan budget.
10. Convert the five existing honaristans to the recommended program. Complete the construction of the Ahwaz plant and the Tabriz plant now under construction.

11. Begin the service of public relations for all parts of the education program and especially for the decentralization of administration shift. The actual shift should not be made until the public opinion in each locality is thoroughly prepared for it. This may or may not be accomplished before the end of the first year. It should not be delayed beyond the beginning of the second year.

Second Year

1. Increase the organization of the education section to approximately half strength. The sub-section on women's education should not be initiated. Certain others should be restricted to immediate programs, as, for example, the mass education media unit.
2. Expand the research program to full strength.
3. Continue the foreign trainee program.
4. Expand the number of foreign technical consultants. The appropriate foreign technical consultant should be brought to Iran at the time of organization of any sub-section or unit and should have a major role in recommending its internal organization and method of operation.
5. Continue the basic library program. Begin importation of research libraries.
6. Conduct a fundamental reorganization of key libraries. This should include a systematic cataloguing of modern technical books and the establishment of an inter-library loan service.
7. Continue the stop-gap semi-skilled labor training program and shift the emphasis of all technical schools to the long-range industrial training program.
8. Complete the construction, equipment, and staffing of the recommended rural teacher training schools.
9. Import one-half of the equipment for the recommended educational missions, activate the teams, and begin the program in the field.
10. Expand the honaristan program to maximum capacity.
11. Expand the public relations service and integrate it with a progressive decentralization of administrative control.
12. Begin decentralization in the areas of teacher appointment, curriculum construction, financing, and school construction.
13. Start the teacher training program. Operate summer schools, teacher institutes, forums, teacher training schools.
14. Vacate the buildings of the Higher Teachers College now occupied by the Faculties of Science and of Literature, modernize the plant, and raise the Higher Teachers College to the status of a Faculty of Education.

Third Year

1. Reach the maximum of the recommended program in all areas.
2. Return the first group of foreign trainees to Iran and begin their use in the system under the guidance of the foreign personnel.
3. Eliminate the stop-gap semi-skilled labor training program.
4. Make a careful budget reappraisal for the remainder of the Seven Year Plan.

Fourth Year

1. Continue the program at maximum capacity.

Fifth Year

1. Conduct a thorough evaluation of the results of the program to that date, and re-examine basic policy decisions.

Sixth Year

1. Begin a very detailed preliminary study of what should be done in a second Seven Year Plan aimed at social development, as contemplated in the Seven Year Plan Act.
2. Make a careful budget reappraisal for the remainder of the Seven Year Plan.

Seventh Year

1. Prepare a detailed plan for the second Seven Year Plan education program. If considered desirable at that time, foreign policy level consultants should be brought to Iran to assist in this project.
2. Eliminate all non-continuing programs.
3. Make the temporary organization of the education section of the Plan Organization permanent by merging with the Ministry of Education on a basis of parity.

A RECOMMENDED BUDGET

It is clearly impossible to make any realistic budgets for the entire period of the Seven Year Plan. It seems well, however, to indicate within broad limits the desirable allocations for each of the recommended projects during the entire period of the Seven Year Plan, and then to indicate an approximately correct budget for the first year of the execution of the program. There are two reasons why this latter budget cannot be accurately forecast before the Plan is put into operation. The first is that formal education is a cyclical operation, with the school year, upon which all programs and budgets must be based, not necessarily coinciding with either the normal fiscal year of the Iranian Government or with the first year of the Seven Year Plan. The second is that virtually all of the projects recommended require financial, personnel, and construction assistance from other existing Government agencies. The budget of the education section of the Plan Organization is in effect only an incentive fund to encourage these other agencies to co-operate in a joint program. Based upon the assumption that the remainder of first year of the Seven Year Plan will coincide with the last half of the current school year and that the other Governmental agencies will co-operate in the degree indicated in the recommended projects, it is possible to present over-all budget allocations for each of the projects. It should be emphasized, however, that these are not detailed operational budgets and that the planning of the specific expenditures within the general allocations is and can only be a part of the continuing administrative procedure of the education section itself. The recommended allocations are shown in Exhibit B-22.

EXHIBITS

Exhibit A-1

Page 1 of 5

DISEASES SHOWING CASES AND DEATHS BY OSTANS—1326

			OSTANS									TOTAL	
NAME OF DISEASE		TEHRAN	1	2	3&4	5	6	7	8	9	10	CASES	DEATHS
A: INFECTIOUS, EPIDEMIC, ENDEMIC AND PARASITIC DISEASES													
Small Pox	C	36	71	58	7	4	63	10	25	96	34	404	
	D	—	2	—	—	—	—	—	3	7	—		12
Scarlet Fever	C	20	8	6	7	55	1	8	—	15	25	145	
	D	—	—	—	—	—	—	—	—	—	—		—
Typhus (Exanthematic)	C	5	98	24	168	23	17	27	21	101	58	542	
	D	—	6	4	7	—	—	5	—	2	—		24
Typhoid and Paratyphoid	C	452	1905	314	1130	235	234	64	73	570	648	5625	
	D	2	45	15	46	—	—	2	2	3	—		115
Diphtheria	C	59	121	88	131	59	78	69	305	40	565	1515	
	D	—	4	7	5	—	—	2	—	—	—		18
Dysentery	C	1138	2398	836	265	1131	396	902	485	820	1749	10120	
	D	1	59	18	1	—	—	17	—	—	—		96
Measles	C	732	217	422	183	854	231	847	44	904	2147	6581	
	D	—	18	12	6	—	—	39	—	2	—		77
Meningitis (Cerebro-Spinal)	C	101	39	5	—	15	—	—	12	2	29	203	
	D	—	6	2	—	—	—	—	—	—	—		8
Grippe (Common Cold)	C	10994	12194	12255	7064	7520	6085	5129	5841	4887	11728	83697	
	D	—	22	2	19	—	—	12	—	6	—		61
Mumps	C	570	944	473	46	384	359	1017	103	572	1273	5741	
	D	—	—	—	—	—	—	—	—	—	—		—
Tuberculosis (Pulmonary)	C	159	601	312	176	206	228	160	56	153	189	2240	
	D	—	89	5	27	11	9	9	2	18	17		187
Malaria (Fever and Chills)	C	41311	96053	95252	20975	110832	29987	20360	15644	31729	32455	494598	
	D	—	76	24	3	10	20	42	13	31	296		515
Recurrent Fever	C	2618	6038	4659	21	2475	5050	1147	1099	16220	11580	50907	
	D	—	95	42	2	20	—	23	—	12	—		194
Anthrax	C	225	213	465	58	39	94	94	155	132	349	1824	
	D	—	7	3	2	—	—	1	—	—	—		13
Whooping Cough	C	598	680	317	2	204	251	421	987	250	1296	5006	
	D	—	9	—	—	—	—	13	—	—	—		22
Glanders	C	1	—	15	—	41	1	—	—	—	90	148	
	D	—	—	—	—	—	—	—	—	—	—		—
Actinomycoses	C	4	106	53	—	—	—	68	—	6	8	245	
	D	—	—	—	—	—	—	—	—	—	—		—
Syphilis	C	27100	7270	7605	3220	3625	2603	3018	4890	5231	11147	75709	
	D	—	16	—	2	—	—	5	7	6	14		50
Oriental Sore	C	207	78	308	—	40	18	274	20	505	1074	2524	
	D	—	—	—	—	—	—	—	—	—	—		—
Puerperal Fever	C	126	368	201	81	81	233	146	47	147	435	1865	
	D	—	2	5	—	—	—	2	—	1	—		10
Trachoma	C	7530	9062	15949	626	16376	23268	20278	10611	9454	37302	150456	
	D	—	—	—	—	—	—	—	—	—	—		—
Fever (Non-classified)	C	1	5	1	—	8	473	60	—	—	78	626	
	D	—	—	—	—	—	—	—	—	—	—		—
Leprosy	C	1	32	4	12	8	1	8	—	4	13	83	
	D	—	2	—	—	—	—	1	—	—	—		3
Erysipelas	C	179	234	300	23	196	166	189	47	225	561	2120	
	D	1	2	—	—	—	—	6	—	2	—		11
Gonorrhea	C	14418	4705	2474	111	1698	1816	1695	898	1199	3996	33010	
	D	—	—	—	—	—	—	3	—	—	—		3
Scabies	C	3335	8802	10532	88	2808	1389	2704	564	4471	2187	36880	
	D	—	—	1	3	—	—	—	—	—	—		4
Infant Diarrheas	C	2584	2297	3135	88	2764	2124	3982	798	1592	7039	26403	
	D	—	58	25	3	2	—	21	—	1	—		110

NOTE: C = Cases; D = Deaths.

Exhibit A-1

Page 2 of 5

NAME OF DISEASE		TEHRAN	OSTANS										TOTAL	
			1	2	3&4	5	6	7	8	9	10		CASES	DEATHS
Rabies	C	—	—	14	—	2	6	—	—	—	—		22	
	D	—	—	1	—	—	—	—	—	—	—			1
Tetanus	C	5	34	18	—	2	3	24	—	13	14		113	
	D	—	13	3	—	—	—	2	—	—	—			18
Acute Rheumatic Fever	C	6243	9839	7467	3730	4140	4641	6165	5409	5330	14536		67500	
	D	—	—	8	—	—	—	—	—	—	—			8
Ringworm of the Scalp	C	1176	6393	4195	152	2133	2817	1705	989	2111	1442		23113	
	D	—	—	—	—	—	—	—	—	—	—			—
Brucellosis (Malta Fever)	C	—	1	3	—	2	—	1	—	4	91		102	
	D	—	—	—	—	—	—	—	—	—	—			—
Yellow Fever	C	—	—	—	—	—	—	—	—	—	—		—	
	D	—	—	—	—	—	—	—	—	—	—			—
Cholera	C	—	—	—	—	—	—	—	—	—	—		—	
	D	—	—	—	—	—	—	—	—	—	—			—
Plague (Lymphatic and Pulmonary)	C	—	—	—	—	—	—	—	—	—	—		—	
	D	—	—	—	—	—	—	—	—	—	—			—
Ascariasis	C	2051	8549	6873	327	4942	3748	1550	876	3027	3714		35657	
	D	—	—	—	—	—	—	—	—	—	—			—
Taeniasis	C	292	3033	1529	9	162	670	1106	62	97	578		7538	
	D	—	—	—	—	—	—	—	—	—	—			—
Tuberculosis Other than Pulmonary	C	20	277	120	238	67	304	76	33	139	269		1543	
	D	—	6	1	1	—	—	1	—	1	—			10
Septicemia	C	195	386	911	134	216	321	894	192	174	487		3910	
	D	—	15	8	—	—	—	10	—	—	—			33
Animal Parasitic Diseases	C	25	5	29	4359	—	305	8	39	67	412		5249	
	D	—	—	—	2	—	—	—	—	—	—			2
Other Epidemic, Endemic, Infectious and Parasitic Diseases	C	14	86	300	1792	1	239	—	12	62	1034		3540	
	D	—	1	6	2	—	—	—	—	—	—			9
Chicken Pox	C	66	24	30	—	84	15	—	73	89	71		452	
	D	—	—	—	—	—	—	—	—	—	—			—
B: TUMORS AND CANCERS														
Tumors (Benign and Malignant)	C	27	31	117	26	37	16	83	13	57	200		607	
	D	—	10	—	1	3	—	8	2	2	21			47
Lymphatic Tumors	C	73	90	154	142	52	310	110	17	321	475		1744	
	D	—	—	—	—	—	—	—	—	—	—			—
C: ENDOCRINE DISEASES														
Diabetes Melitus	C	55	69	46	20	35	49	32	25	45	161		537	
	D	—	4	—	—	—	—	—	—	—	—			4
Avitaminosis	C	298	260	594	755	220	1290	182	247	341	1704		5891	
	D	—	—	—	1	—	—	5	—	—	—			6
Other Endocrine Diseases	C	344	2037	480	784	164	1039	1419	238	447	1039		7991	
	D	—	—	—	—	—	—	9	—	—	—			9
D: BLOOD DISEASES														
Anemias	C	1601	14545	4664	4222	1341	4431	748	1892	2208	5524		41176	
	D	—	35	6	2	—	—	—	—	—	—			43
Leukemias	C	82	32	31	—	37	144	119	27	110	135		717	
	D	—	—	3	—	—	—	—	—	—	—			3
Other Circulatory Diseases	C	286	819	1070	11	82	447	229	627	106	936		4613	
	D	—	5	6	—	—	—	—	—	—	—			11
E: POISONING														
Acute and Chronic Alcoholism	C	—	1	65	28	51	33	46	—	60	107		391	
	D	—	—	—	—	—	—	—	—	—	—			—
Chronic Poisoning	C	130	2	381	133	38	43	212	11	85	148		1183	
	D	—	—	—	—	—	—	1	—	—	—			1

NOTE: C = Cases; D = Deaths.

Exhibit A-1

NAME OF DISEASE		TEHRAN	OSTANS									TOTAL	
			1	2	3&4	5	6	7	8	9	10	CASES	DEATHS
F: DISEASES OF THE NERVOUS SYSTEM													
Meningitis	C	35	9	65	16	29	29	62	—	31	247	523	
	D	—	2	2	2	—	—	1	—	—	—		7
Encephalitis	C	12	9	53	16	31	13	56	3	34	84	311	
	D	—	—	4	—	—	—	—	—	—	—		4
Apoplexies	C	34	118	138	164	54	137	78	19	46	184	972	
	D	—	51	4	18	—	—	7	—	—	—		80
General Paralysis	C	50	141	69	76	73	56	149	30	29	212	885	
	D	—	13	5	—	—	—	—	—	—	—		18
Other Mental Diseases	C	192	40	880	90	44	569	135	29	187	376	2542	
	D	—	1	—	1	—	1	1	—	—	—		4
Epilepsy	C	133	104	485	95	76	204	237	58	106	1046	2544	
	D	—	7	—	—	—	—	—	—	—	—		7
Other Nervous Disorders	C	566	7434	1855	382	975	1586	1038	327	2320	3506	19989	
	D	—	1	—	—	—	—	—	2	—	—		3
Diseases of Eyes	C	9175	10927	17647	5098	6556	15044	10604	11752	7242	54396	148441	
	D	—	—	—	—	—	—	—	—	—	—		—
Diseases of Ears	C	4514	3412	4017	3027	1965	5887	3889	3217	3420	6739	40087	
	D	—	—	—	—	—	—	—	—	—	—		—
G: CIRCULATORY DISEASES													
Pericarditis (Acute)	C	114	30	138	38	50	76	611	49	279	396	1781	
	D	—	1	—	—	—	—	8	1	—	—		10
Endocarditis (Acute)	C	102	292	253	25	42	135	270	20	129	1135	2403	
	D	—	7	2	1	—	—	12	—	—	—		22
Chronic Endocartitis and Valvulitis	C	62	50	216	7	71	74	195	63	46	1967	2751	
	D	—	—	7	—	—	—	6	9	—	—		22
Acute and Chronic Myocarditis	C	70	109	77	43	60	277	190	7	66	176	1075	
	D	—	6	3	—	—	—	—	2	—	—		11
Angina Pectoris	C	635	198	1170	74	417	78	146	170	523	1557	4968	
	D	—	—	—	—	—	—	—	—	—	—		—
Arteriosclerosis	C	108	448	168	94	62	208	220	12	325	552	2197	
	D	—	3	—	—	—	—	—	—	—	—		3
Embolism	C	1	2	3	1	3	4	2	—	99	148	263	
	D	—	—	2	—	—	—	1	—	—	—		3
Other Circulatory Diseases	C	1219	932	1085	959	277	1359	664	442	1014	2353	10304	
	D	—	44	2	—	—	—	9	—	—	—		55
H: PULMONARY DISEASES													
Bronchitis	C	6563	7952	10516	3511	5317	5175	4703	4009	5128	13929	66803	
	D	10	40	14	10	—	—	18	8	—	—		100
Bronchopneumonia	C	172	237	281	29	390	138	193	135	379	268	2222	
	D	3	6	11	4	—	—	53	16	—	—		93
Pneumonia	C	1134	1860	1612	514	904	762	948	658	1000	1609	11001	
	D	18	160	92	—	—	—	70	68	—	—		408
Pleurisy	C	99	321	119	50	91	282	153	141	228	1073	2557	
	D	12	6	31	—	—	—	6	1	—	—		56
Other Pulmonary Diseases except for Tuberculosis	C	3021	1488	2081	2825	422	3557	511	458	1112	3131	18606	
	D	1	38	3	1	—	—	1	—	—	—		44
1: DIGESTIVE DISORDERS													
Gastric & Duodenal Ulcers	C	76	26	175	55	30	142	134	20	908	481	2047	
	D	1	—	2	1	—	—	16	—	—	—		20
Diarrhea and Enteritis—2 yrs.	C	1319	1695	3004	854	1077	2226	2794	1292	971	3954	19186	
	D	5	17	17	5	—	—	41	—	—	—		85
Diarrhea and Enteritis 2 yrs. +	C	6009	6148	7028	3085	3024	4639	2070	3632	3939	6459	46033	
	D	17	115	14	17	—	—	75	26	—	—		264
Appendicitis	C	19	19	77	10	8	51	109	17	46	68	424	
	D	—	—	—	—	—	—	—	—	—	—		—

NOTE: C = Cases; D = Deaths.

Exhibit A-1

			OSTANS									TOTAL	
NAME OF DISEASE		TEHRAN	1	2	3&4	5	6	7	8	9	10	CASES	DEATHS
Intestinal Obstruction and Hernias	C	73	191	351	31	64	295	171	49	138	457	1820	
	D	—	5	1	—	—	—	2	8	—	—		16
Cirrhosis of the Liver	C	101	108	99	86	196	230	158	59	985	501	2523	
	D	1	2	—	1	—	—	13	5	—	—		22
Cholelithiasis	C	60	15	22	46	5	116	157	6	67	482	976	
	D	—	—	—	—	—	—	—	—	—	—		—
Other Digestive Disorders	C	11769	10097	11557	6272	5518	10125	4700	7423	10060	13266	90787	
	D	1	7	2	1	—	—	14	1	—	—		26
J: URINARY AND REPRODCTIVE DISEASES													
Acute Nephropathies	C	508	987	856	247	599	538	306	593	593	1389	6616	
	D	—	57	2	2	—	—	3	—	—	—		64
Chronic Nephropathies	C	432	274	517	319	172	701	168	444	444	621	4092	
	D	5	10	14	4	—	—	15	—	—	—		48
Nephrolithiasis	C	68	36	100	54	25	206	104	46	43	59	741	
	D	—	—	1	—	—	—	6	—	—	—		7
Other Nephropathies and Diseases of Bladder and Urether	C	65	37	28	36	16	82	58	58	21	54	455	
	D	—	—	—	—	—	—	2	—	—	—		2
Diseases of Bladders Except for Tumors	C	28	35	137	9	10	128	25	9	16	151	548	
	D	—	—	2	—	—	—	1	—	—	—		3
Diseases of Urinary System	C	114	547	247	74	34	278	76	44	114	348	1876	
	D	—	4	—	—	—	—	2	—	—	—		6
Diseases of Reproductive System Other Than Venereal	C	570	399	1232	44	51	285	421	44	253	75	3374	
	D	—	2	—	—	—	—	—	—	—	—		2
K: PREGNANCY AND PUERPERAL DISEASES													
Pregnancy Disorders and Anomalies	C	836	153	533	264	118	587	178	66	137	4082	6954	
	D	1	11	9	1	—	—	7	2	—	—		31
Hemorrhage (Uterine)	C	490	330	1109	114	300	363	166	6	226	1663	4767	
	D	4	1	—	—	—	—	2	—	—	—		7
Albuminuria and Eclampsia	C	63	24	69	28	45	80	27	5	52	51	444	
	D	—	1	6	—	—	—	—	—	—	—		7
Other Hemorrhagic Diseases	C	1756	2456	1671	1097	361	1199	2790	172	292	2168	13962	
	D	—	1	3	—	—	—	1	—	—	—		5
L: DISEASES OF SKIN													
Diseases of Skin and Its Appendages	C	6544	12174	16972	3404	4529	4771	3663	8057	8119	9302	77535	
	D	—	3	—	—	—	—	—	—	—	—		3
M: DISEASES OF LOCOMOTIVE SYSTEM													
Except for Tuberculosis	C	33	114	480	17	31	180	338	51	196	727	2167	
	D	—	—	2	—	—	—	—	—	—	—		2
N: ANOMALIES (FETAL)													
Except for Dead Fetus	C	40	2	6	—	13	10	18	9	—	78	176	
	D	—	—	4	—	—	—	1	8	—	—		13
O: DISEASES OF NEWBORN													
Weakness Jaundice	C	7	23	11	3	17	88	8	21	18	111	307	
	D	—	—	1	—	—	—	1	11	—	—		13
Prematurity	C	5	15	41	5	17	91	20	42	15	60	311	
	D	3	7	1	3	—	—	8	8	—	—		30
Other Newborn Diseases	C	15	23	15	13	2	212	21	117	41	245	704	
	D	1	—	—	1	—	—	11	3	3	—		19
P: OLD AGE	C	348	46	231	314	120	763	105	34	161	376	2498	
	D	29	6	88	29	—	—	46	7	3	—		208

NOTE: C = Cases; D = Deaths.

Exhibit A-1

NAME OF DISEASE		TEHRAN	OSTANS										TOTAL	
			1	2	3&4	5	6	7	8	9	10		CASES	DEATHS
Q: EMERGENCY ACCIDENTAL DEATHS														
Suicide	C	27	6	11	16	13	17	3	3	7	10		113	
	D	1	1	8	—	13	—	1	3	—	5			32
Homicide	C	12	1	18	7	18	7	3	1	14	9		90	
	D	12	1	—	7	18	7	3	1	14	9			72
Wounds Due to Fight	C	2233	1653	7016	1947	1588	3336	1572	868	1575	6108		27896	
	D	1	—	—	1	—	—	3	1	—	—			6
Acute Accidental Poisoning	C	148	73	24	123	68	140	391	92	130	248		1437	
	D	7	2	1	7	—	—	2	4	—	—			23
Injuries Due to Fire and Burn	C	1232	744	2629	876	467	975	226	403	746	762		9060	
	D	5	4	10	5	—	—	5	—	—	—			29
Drownings	C	18	9	15	18	7	18	17	9	11	8		130	
	D	2	—	3	4	7	—	13	2	—	—			31
Accidents (Falls)	C	377	768	1121	36	441	36	148	131	1074	2755		6887	
	D	—	—	1	4	—	—	—	1	—	—			6
Accidents in Mines	C	16	39	135	—	2	—	—	52	2	4		250	
	D	1	—	—	—	—	—	—	—	—	—			1
Traffic Accidents	C	838	15	9	338	20	338	28	4	41	63		1694	
	D	4	4	2	19	—	—	2	—	—	—			31
Electrical Accidents	C	—	—	1	3	—	3	—	—	4	—		11	
	D	—	—	1	—	—	—	—	—	—	—			1
Deaths Due to Other Accidents	C	—	—	—	—	—	—	—	—	—	—		—	
	D	3	9	11	4	9	4	12	1	3	9			65
R: MISCELLANEOUS														
Disease of Unknown Etiology	C	2630	617	957	113	456	—	113	10	285	823		6004	
	D	113	211	24	113	—	—	44	—	—	—			505

TOTAL CASES.............1,900,926

TOTAL DEATHS 4,393

NOTE: C = Cases; D = Deaths.

Exhibit A-2

CURRICULUM FOR THE TRAINING OF BEHDARS

FIRST YEAR

	HOURS PER WEEK
Theoretical and practical chemistry	4
Practical physiology	1
Anatomy	9
Foreign languages	2
Botany	2
Elementary parasitology	2
Embryology	8
Bacteriology	8
Histology	8

SECOND YEAR

MORNINGS	
Elementary medicine and diagnosis	4 months
Surgery	2 months
Opthalmology	2 months

AFTERNOONS THROUGHOUT THE YEAR	HOURS PER WEEK
Histology, pathology (practical and theoretical)	4
Bacteriology and parasitology	6
Internal medicine	4
Dermatology	4
Foreign language	2

THIRD YEAR

MORNINGS	
Clinical medicine	2 months
Clinical dentistry	2 months
Clinical eye, ear, nose, and throat	2 months
Clinical fractures	2 months

AFTERNOONS THROUGHOUT THE YEAR	HOURS PER WEEK
Recognition of drugs and therapeutics	4
Writing and preparation of prescriptions	1
Dermatology	4
Internal medicine	4

FOURTH YEAR

MORNINGS	
Clinical midwifery and obstetrics	2 months
Clinical pediatrics and infectious diseases	2 months
Skin and venereal diseases	2 months
Medical practice in the polyclinic	

AFTERNOONS THROUGHOUT THE YEAR	HOURS PER WEEK
Tropical and epidemic diseases with laboratory work	2
Medical conferences	1
Internal diseases	4
Dermatology	4

NOTES: While taking clinical medicine and surgery the students stay in the hospital at night.

Some village visiting is included during the fourth year.

There is a summer internship following the fourth year.

Exhibit A-3

CURRICULUM OF THE THREE-YEAR SCHOOL OF MIDWIFERY

FIRST YEAR	NO. LECTURES PER WEEK
Nursing	1
Child growth	1
Hip anatomy	1
General anatomy	1
Hygiene	1
Physiology	1
Foreign language	1
Embryology	1

Practical training at all times of the day except in times allowed for lectures:

- Clinic for child diseases
- Infectious diseases section
- Clinic and section for surgery
- Clinic for childbirth and care of newborn

SECOND YEAR	
Normal childbirth	2
Minor surgery	1
Microbiology	1
Infectious diseases	1
Foreign language	1

Practical training at all times of the day except in times allowed for lectures:

- Clinic—child diseases
- Clinic—women's diseases
- Section of surgery
- Section for childbirth
- Laboratory

THIRD YEAR	
Gynecology	2
Normal childbirth	2
Child diseases	1
Infectious diseases	1
Hygiene	1
Principles of therapeutics	1

Practical training at all times of the day except in times allowed for lectures:

- Extern course in hospitals and Institute of Protection of Mothers and Babies:
  - Section for child diseases
  - Section for gynecology
  - Section for childbirth
  - Surgical section
  - Night-watch service at the expectant's house

Exhibit A-4

CURRICULUM OF THE TWO-YEAR MIDWIFERY SCHOOL AT SHIRAZ

First Six Months

MORNING

Training in hospital—cleanliness, nursing care

AFTERNOON

Anatomy and general physiology, anatomy and physiology of the genital organs of women, a few points on microbiology and disinfection

Second Six Months

MORNING

Care of the expectant mother and baby and help in childbirth

AFTERNOON

Anatomy and physiology of expectancy, natural childbirth, child care

Third Six Months

MORNING AND NIGHT

Protection, childbirth, care of babies

AFTERNOON

Natural childbirth (in continuation of the preceding year), principal diseases of babies, complications of pregnancy

Fourth Six Months

MORNING AND NIGHT

Protection, childbirth, nursing of disease and the care of expectant mothers and babies

AFTERNOON

Abnormal childbirth, child diseases, care of mothers and babies

Note: As a general rule mornings are spent in clinic training and afternoons in theoretical training.

Exhibit A-5

CURRICULUM OF THE TWO-YEAR NURSING SCHOOLS APPROVED IN 1316

Subject	No. of Class Hours
Anatomy and physiology	96
Microbiology	16
Pharmocology	35
Preparation of solutions	8
Internal diseases	32
Contagious diseases	16
Tuberculosis	2
Nervous diseases	3
Pediatrics	12
Child-nursing	4
Diseases of eyes, ears, throat and nose	4
Nursing procedures	2
Ethics in nursing	12
Personal hygiene	16
History of nursing	12
Scientific teaching for patient's nutrition	24
Cooking	8
Nursing procedures	18
Practical nursing	84
Conduct in operating room	12
Surgery	32
Foreign language	114
Women's diseases	4
Midwifery	24
Nursing of mothers and infants	16

Exhibit A-6

CURRICULUM FOR TRAINING OF VILLAGE NURSES

Two Months

MORNING

Working in the rooms of patients, household work, cleanliness, preliminary care

AFTERNOON

General information on anatomy and physiology, contagion and disinfection

Three Months

MORNING

Clinic training
Medical training

AFTERNOON

Internal diseases, nutrition of healthy people and patients, housing hygiene, hospital hygiene, drug-making, and medical elements

Three Months

MORNING

Surgery

AFTERNOON

Some elementary information on surgical and medical science, combat against disease

Two Months

MORNING

Infectious diseases

AFTERNOON

Prophylactic medicine
Control of infectious diseases

Two Months

MORNING

Child dispensary

AFTERNOON

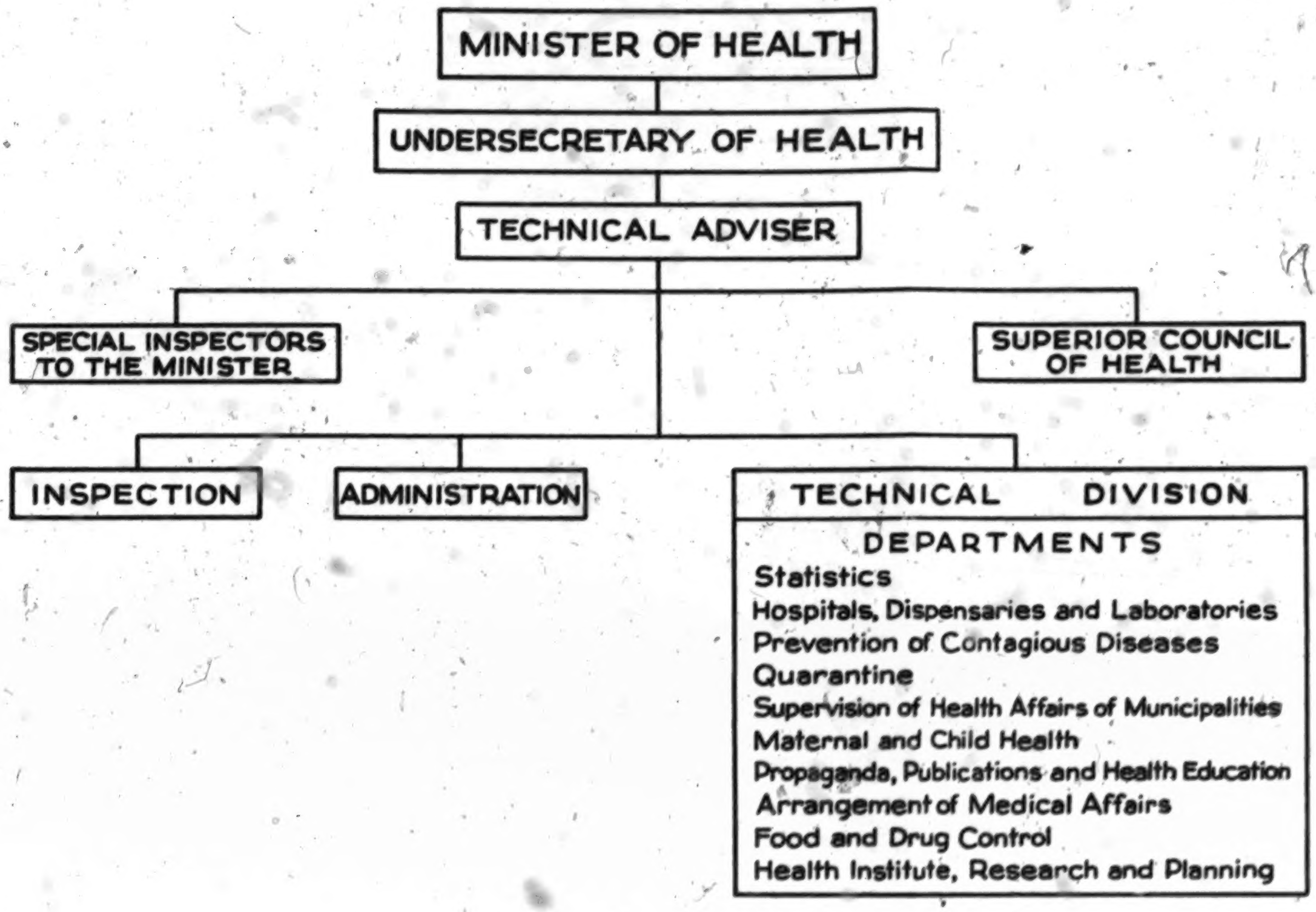
Pediatrics and principles of child growth

EXHIBIT A-7

PRESENT ORGANIZATION OF THE MINISTRY OF HEALTH

UNDER THE LAW OF 22 AZAR 1324

OVERSEAS CONSULTANTS, INC.
NEW YORK
1949


MINISTER OF HEALTH
UNDERSECRETARY OF HEALTH
TECHNICAL ADVISER
SPECIAL INSPECTORS TO THE MINISTER
SUPERIOR COUNCIL OF HEALTH
INSPECTION
ADMINISTRATION
TECHNICAL DIVISION
DEPARTMENTS
Statistics
Hospitals, Dispensaries and Laboratories
Prevention of Contagious Diseases
Quarantine
Supervision of Health Affairs of Municipalities
Maternal and Child Health
Propaganda, Publications and Health Education
Arrangement of Medical Affairs
Food and Drug Control
Health Institute, Research and Planning

ORGANIZATION IN EACH OF THE TEN OSTANS

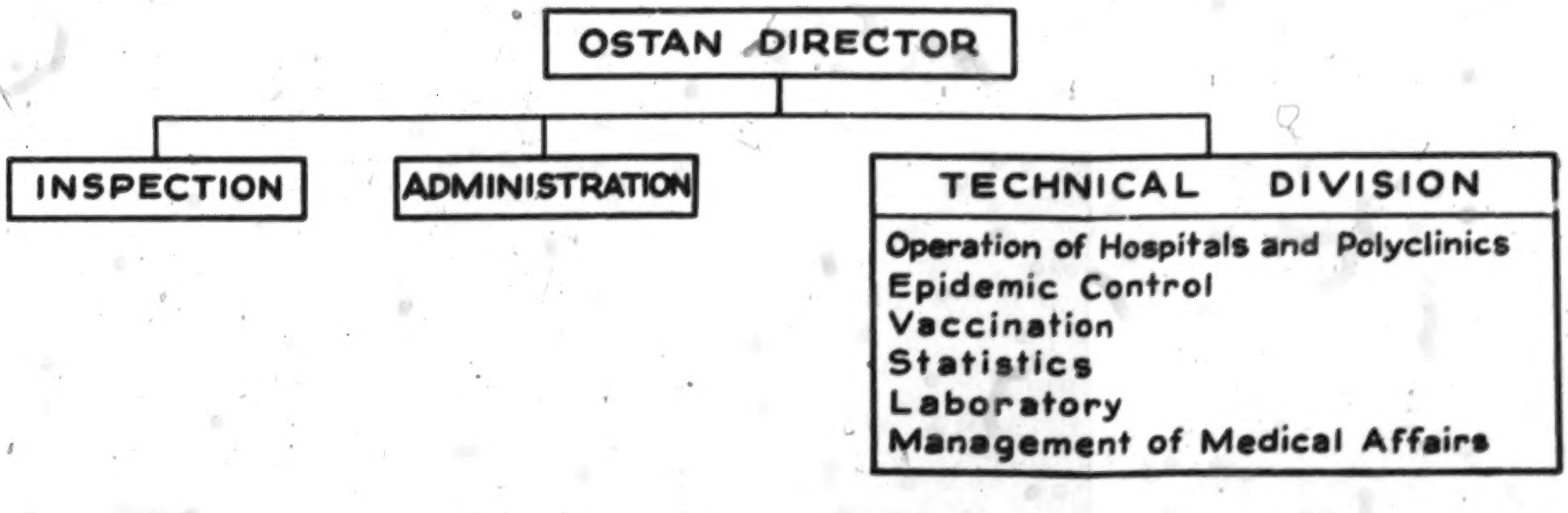

OSTAN DIRECTOR
INSPECTION
ADMINISTRATION
TECHNICAL DIVISION
Operation of Hospitals and Polyclinics
Epidemic Control
Vaccination
Statistics
Laboratory
Management of Medical Affairs

Exhibit A-8

MINISTRY OF HEALTH STAFF

Technical Personnel, Population, Villages, Hospitals, and Polyclinics—1327

Ostan	Population	No. Villages	No. of Health Stations	Physicians		Dentists		Midwives		Pezeshkyars	Nurses		Vaccinators	Hospitals	Polyclinics
				G	C	G	C	G	C		M	F			
1	1,700,000	4077	44	41	20	4	2	—	13	53	71	55	38	14	37
2*	3,350,000	5032	64	224	75	10	5	5	95	128	146	287	43	26	55
3 & 4	2,800,000	6535	51	37	27	2	2	—	8	41	105	80	34	19	36
5	1,950,000	5624	31	20	21	3	1	—	5	35	48	30	41	9	32
6	1,700,000	4466	24	34	6	1	1	—	7	35	50	25	25	7	36
7	1,300,000	3320	20	16	18	2	—	—	1	28	99	53	41	11	18
8	950,000	3593	25	16	13	1	1	—	2	15	51	14	34	7	24
9	2,450,000	5786	33	21	23	—	—	—	1	17	27	36	35	3	34
10	1,550,000	2112	52	37	47	—	3	—	2	27	55	31	30	8	49
Total	17,750,000	40,545	344	446	250	23	15	5	134	379	652	611	321	104	321

* Includes Tehran.

Note: G = Graduate.
C = Certified.
M = Male.
F = Female.

Exhibit A-9

WORKERS IN THE MINISTRY OF HEALTH—1326

Ostan	Doctors		Dentists		Pharmacists		Midwives		Admin. Employees		Nurses		Gatekeeper & Washerwomen		Asst. Doctors		Smallpox Vaccinators		Insect Control Workers		Drivers & Misc.		Total
	G	L	G	L	G	L	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1	35	25	5	–	3	–	2	9	36	4	70	9	41	–	85	71	36	1	–	–	11	–	443
2	228	87	12	4	21	–	66	31	247	22	148	48	60	–	239	275	419	–	5	–	53	–	1965
3	29	12	–	–	2	1	5	1	58	1	35	6	29	–	105	39	86	–	–	–	4	–	413
4	13	8	1	1	–	–	1	1	13	1	20	2	21	–	44	12	51	–	–	–	–	–	189
5	36	21	2	–	2	–	5	–	10	8	51	1	47	–	54	27	68	–	1	–	4	–	337
6	18	7	2	–	1	3	4	1	17	–	36	1	23	–	47	20	60	–	–	–	6	–	246
7	17	19	1	1	1	–	–	4	19	–	27	8	25	1	8	15	23	–	1	–	6	–	176
8	16	11	2	1	3	–	1	–	21	1	31	2	40	–	50	16	49	–	–	–	8	–	252
9	16	22	1	–	–	3	3	1	13	–	28	–	59	1	23	25	47	–	2	–	3	–	247
10	34	31	–	–	2	2	4	–	23	–	31	4	29	–	58	25	48	–	–	–	1	–	292
Total	442	243	26	7	35	9	91	48	457	37	477	81	374	2	713	525	887	1	9	–	96	–	4560

Note: G = Graduate
L = Licensed
M = Male
F = Female

Exhibit A-10

MEDICAL SERVICES BY OSTANS—1326

		Hospital Beds							
		Private		Ministry of Health					
	Population	Number of Hospitals	Number of Beds	Number of Hospitals	Number of Beds	Total Number of Beds	Population Per Bed	Graduate Doctors in Private Practice	Population Per Doctor in Private Practice
Tehran	800,000	19	2,742	7	1,703	4,445	180	469	1,706
Ostan 1	1,700,000	6	107	10	264	371	4,582	31	54,839
" 2	2,550,000	3	107	20	635	742	3,437	16	159,375
" 3	2,200,000	9	525	13	399	924	2,381	39	56,410
" 4	600,000	4	135	6	189	324	1,852	6	100,000
" 5	1,950,000	4	188	7	181	369	5,285	21	92,857
" 6	1,700,000	5	516	8	230	746	2,279	8	212,500
" 7	1,300,000	4	299	10	220	519	2,505	5	260,000
" 8	950,000	7	358	7	125	483	1,967	1	950,000
" 9	2,450,000	8	564	9	260	824	2,973	33	74,242
" 10	1,550,000	7	310	9	222	532	2,914	36	43,056
Total	17,750,000	76	5,851	106	4,428	10,279	1,727*	665	26,692*

---

* Average.

Exhibit A-11

STATISTICS OF THE RAILROAD HEALTH DEPARTMENT

	1326	1325
Number of visits by patients to polyclinics	479,647	450,907
Number of entrance examinations	3,657	3,434

CASES TREATED

	1326	1325		1326	1325
Malaria	785	109	Digestive disorders	215	256
Pneumonia	133	103	Wounds	198	314
Pleurisy	6	9	Fractures and dislocations	38	66
Other pulmonary diseases	244	214	Abscesses	9	36
Typhoid	30	32	Dermatitis	45	57
Grippe	303	258	Syphilis	41	29
Tuberculosis	117	80	Gonorrhea	16	28
Inflammation	43	43	Eye diseases	147	166
Typhus	1	4	Ear, Nose and Throat	309	188
Recurrent Fever	27	203	Rheumatism	89	139
Diarrhea	123	147	Nervous disorders	90	47
Cardiac diseases	56	41	Burns	22	18
Kidney disorders	51	39	Miscellaneous	441	447
Liver disorders	77	55	Mortality	69	69

POSITIVE TESTS MADE IN LABORATORY--1326

Malaria, Falciparum	79	Soft chancre	3
Malaria vivax	214	Hard chancre	8
Recurrent fever	29	Belheziar	1
Syphilis	275	Arcaris eggs	81
Oriental sore	3	Endamoeba coli	11
Typhoid	15	Taenia	8
Tuberculosis	53	Oxyuris	3
Ringworm of scalp	7	Trichomonas	8
Gonorrhea	22	Balantidii coli	19
Anthrax	13	Lamblia	12
Bacteremia	3	Amoebic dysentery	1
Diphtheria	6		

Exhibit A-12

RECOMMENDED ALLOCATION OF PLAN FUNDS FOR MALARIA PREVENTION

In Thousands of Rials

	PERSONNEL	SPRAYING	TRANSPORTATION EQUIPMENT	DRUGS AND GAMBUSIA	TOTAL
1328—Second Half					
Domestic	8,765	—	—	250	9,015
Foreign Exchange	2,535	—	9,844	1,500	13,879
Total	11,300	—	9,844	1,750	22,894
1329					
Domestic	17,530	26,355	1,000	500	45,385
Foreign Exchange	3,640	8,645	500	3,000	15,785
Total	21,170	35,000	1,500	3,500	61,170
Remaining 5½ Years					
Domestic	96,415	90,360	11,000	2,750	200,525
Foreign Exchange	3,705	29,640	5,500	16,500	55,345
Total	100,120	120,000	16,500	19,250	255,870
Recapitulation					
Domestic	122,710	116,715	12,000	3,500	254,925
Foreign Exchange	9,880	38,285	15,844	21,000	85,009
Total	132,590	155,000	27,844	24,500	339,934

Exhibit A-13

RECOMMENDED ALLOCATION OF PLAN FUNDS FOR HEALTH EDUCATION

In Thousands of Rials

	PERSONNEL	FILM AND PROJECTORS	SOUND TRUCKS	RADIO AND SOURCE MATERIAL	TOTAL
1328—Second Half					
Domestic	1,103	—	—	455	1,558
Foreign Exchange	195	1,238	625	—	2,058
Total	1,298	1,238	625	455	3,616
1329					
Domestic	1,621	—	—	440	2,061
Foreign Exchange	260	1,099	1,000	—	2,359
Total	1,881	1,099	1,000	440	4,420
Remaining 5½ Years					
Domestic	17,264	—	—	2,590	19,854
Foreign Exchange	975	2,960	—	—	3,935
Total	18,239	2,960	—	2,590	23,789
Recapitulation					
Domestic	19,988	—	—	3,485	23,473
Foreign Exchange	1,430	5,297	1,625	—	8,352
Total	21,418	5,297	1,625	3,485	31,825

Exhibit A-14

RECOMMENDED ALLOCATION OF PLAN FUNDS FOR PUBLIC HEALTH LABORATORIES

In Thousands of Rials

	Training	Adminis-tration	Laboratory Equipment	Laboratory Operation	Total
1329					
Domestic	469	—	—	3,600	4,069
Foreign Exchange	130	—	3,250	—	3,380
Total	599	—	3,250	3,600	7,449
Remaining 5½ Years					
Domestic	469	1,000	—	32,400	33,869
Foreign Exchange	—	—	3,250	—	3,250
Total	469	1,000	3,250	32,400	37,119
Recapitulation					
Domestic	938	1,000	—	36,000	37,938
Foreign Exchange	130	—	6,500	—	6,630
Total	1,068	1,000	6,500	36,000	44,568

Exhibit A-15

RECOMMENDED ALLOCATION OF PLAN FUNDS FOR CONTROL OF TUBERCULOSIS, SYPHILIS AND TRACHOMA

In Thousands of Rials

	TUBERCULOSIS	SYPHILIS	TRACHOMA	TOTAL
1328—Second Half				
Domestic	—	—	590	590
Foreign Exchange	—	—	50	50
Total	—	—	640	640
1329				
Domestic	825	1,625	2,750	5,200
Foreign Exchange	800	—	500	1,300
Total	1,625	1,625	3,250	6,500
Remaining 5½ Years				
Domestic	42,475	44,875	52,000	139,350
Foreign Exchange	2,400	—	11,500	13,900
Total	44,875	44,875	63,500	153,250
Recapitulation				
Domestic	43,300	46,500	55,340	145,140
Foreign Exchange	3,200	—	12,050	15,250
Total	46,500	46,500	67,390	160,390

Exhibit A-16

RECOMMENDED ALLOCATION OF PLAN FUNDS FOR TRAINING PERSONNEL

In Thousands of Rials

	FELLOWSHIPS	BEHDARS	MIDWIVES	NURSES	SANITARIANS	BOOKS	TOTAL
1328—Second half							
Domestic	–	3,730	1,850	1,850	700	–	8,130
Foreign Exchange	1,000	–	–	–	–	200	1,200
Total	1,000	3,730	1,850	1,850	700	200	9,330
1329							
Domestic	–	8,530	4,250	4,250	1,000	–	18,030
Foreign Exchange	3,000	–	–	–	–	30	3,030
Total	3,000	8,530	4,250	4,250	1,000	30	21,060
Remaining 5½ Years							
Domestic	–	25,120	9,800	9,800	3,100	–	47,820
Foreign Exchange	6,000	–	–	–	–	120	6,120
Total	6,000	25,120	9,800	9,800	3,100	120	53,940
Recapitulation							
Domestic	–	37,380	15,900	15,900	4,800	–	73,980
Foreign Exchange	10,000	–	–	–	–	350	10,350
Total	10,000	37,380	15,900	15,900	4,800	350	84,330

Exhibit A-17

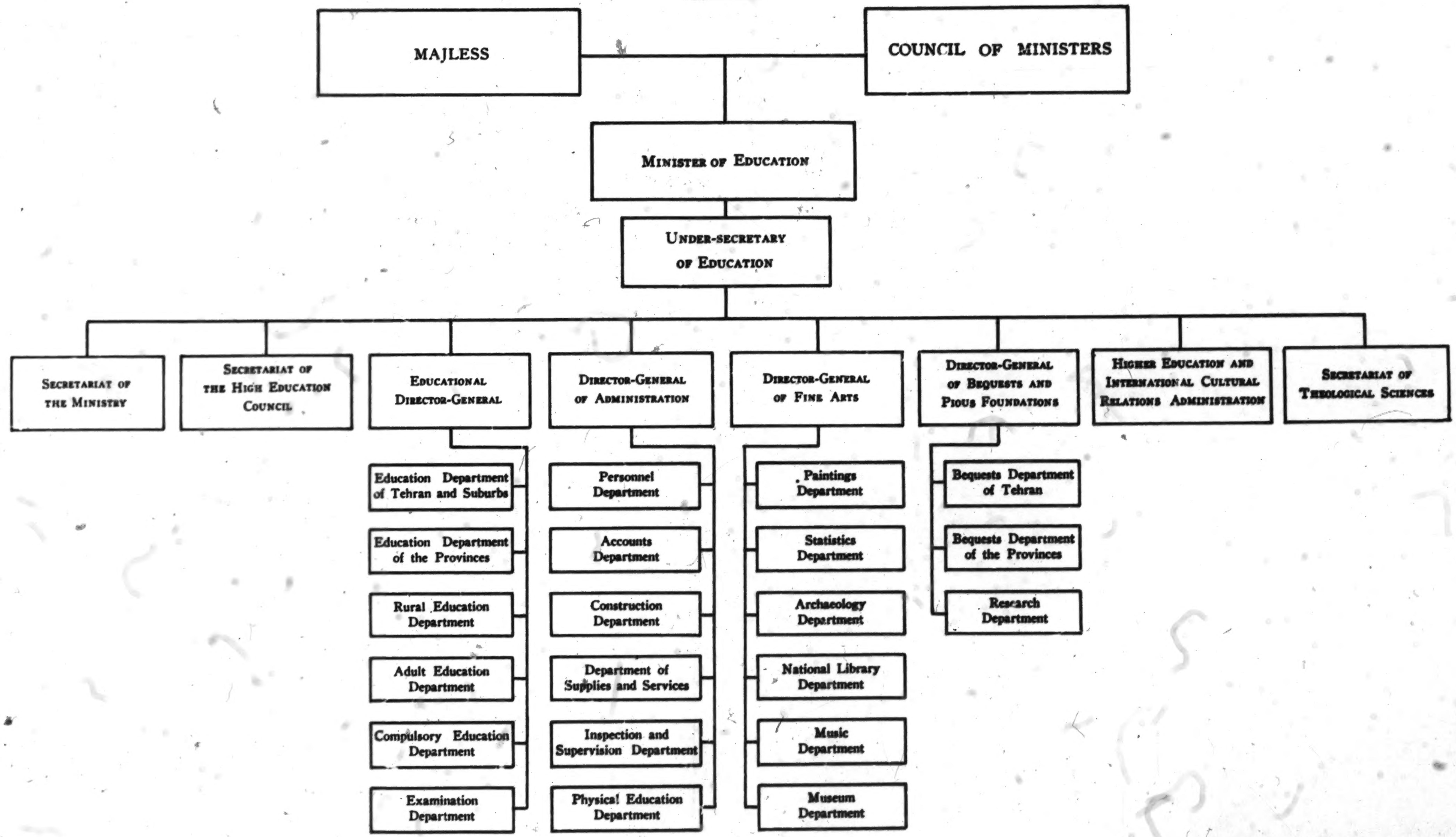
RECOMMENDED ALLOCATION OF PLAN FUNDS FOR PUBLIC HEALTH

In Thousands of Rials

	1328—Second Half			1329			Remaining 5½ Years			Total		
	Domestic	Foreign Exchange	Total	Domestic	Foreign Exchange	Total	Domestic	Foreign Exchange	Total	Domestic	Foreign Exchange	Total
Malaria	9,015	13,879	22,894	45,385	15,785	61,170	200,525	55,345	255,870	254,925	85,009	339,934
Sanitation	7,500	—	7,500	15,000	—	15,000	82,500	—	82,500	105,000	—	105,000
Health Education	1,558	2,058	3,616	2,061	2,359	4,420	19,854	3,935	23,789	23,473	8,352	31,825
Public Health Laboratories	—	—	—	4,069	3,380	7,449	33,869	3,250	37,119	37,938	6,630	44,568
Tuberculosis, Syphilis and Trachoma	590	50	640	5,200	1,300	6,500	139,350	13,900	153,250	145,140	15,250	160,390
Vaccination	11,850	—	11,850	22,300	—	22,300	122,350	—	122,350	156,500	—	156,500
Maternal and Child Health	2,625	—	2,625	10,250	—	10,250	87,125	—	87,125	100,000	—	100,000
Industrial Hygiene	—	—	—	500	—	500	3,000	—	3,000	3,500	—	3,500
Quarantine	—	—	—	7,000	—	7,000	35,000	—	35,000	42,000	—	42,000
National Institute of Health	2,500	—	2,500	2,500	—	2,500	70,000	—	70,000	75,000	—	75,000
Opium and Drug Addiction	500	—	500	1,000	—	1,000	5,500	—	5,500	7,000	—	7,000
Dental Health	100	—	100	200	—	200	5,200	—	5,200	5,500	—	5,500
Vital Statistics	250	—	250	500	—	500	2,750	—	2,750	3,500	—	3,500
Nutrition Survey	—	—	—	—	—	—	6,000	—	6,000	6,000	—	6,000
Recreation Survey	—	—	—	—	—	—	611	741	1,352	611	741	1,352
Rural Health Centers	9,900	100	10,000	39,500	500	40,000	252,500	2,500	255,000	301,900	3,100	305,000
Training Personnel	8,130	1,200	9,330	18,030	3,030	21,060	47,820	6,120	53,940	73,980	10,350	84,330
General Administration	1,433	2,259	3,692	2,866	3,088	5,954	15,763	6,323	22,086	20,062	11,670	31,732
Total	55,951	19,546	75,497	176,361	29,442	205,803	1,129,717	92,114	1,221,831	1,362,029	141,102	1,503,131

Exhibit B-1

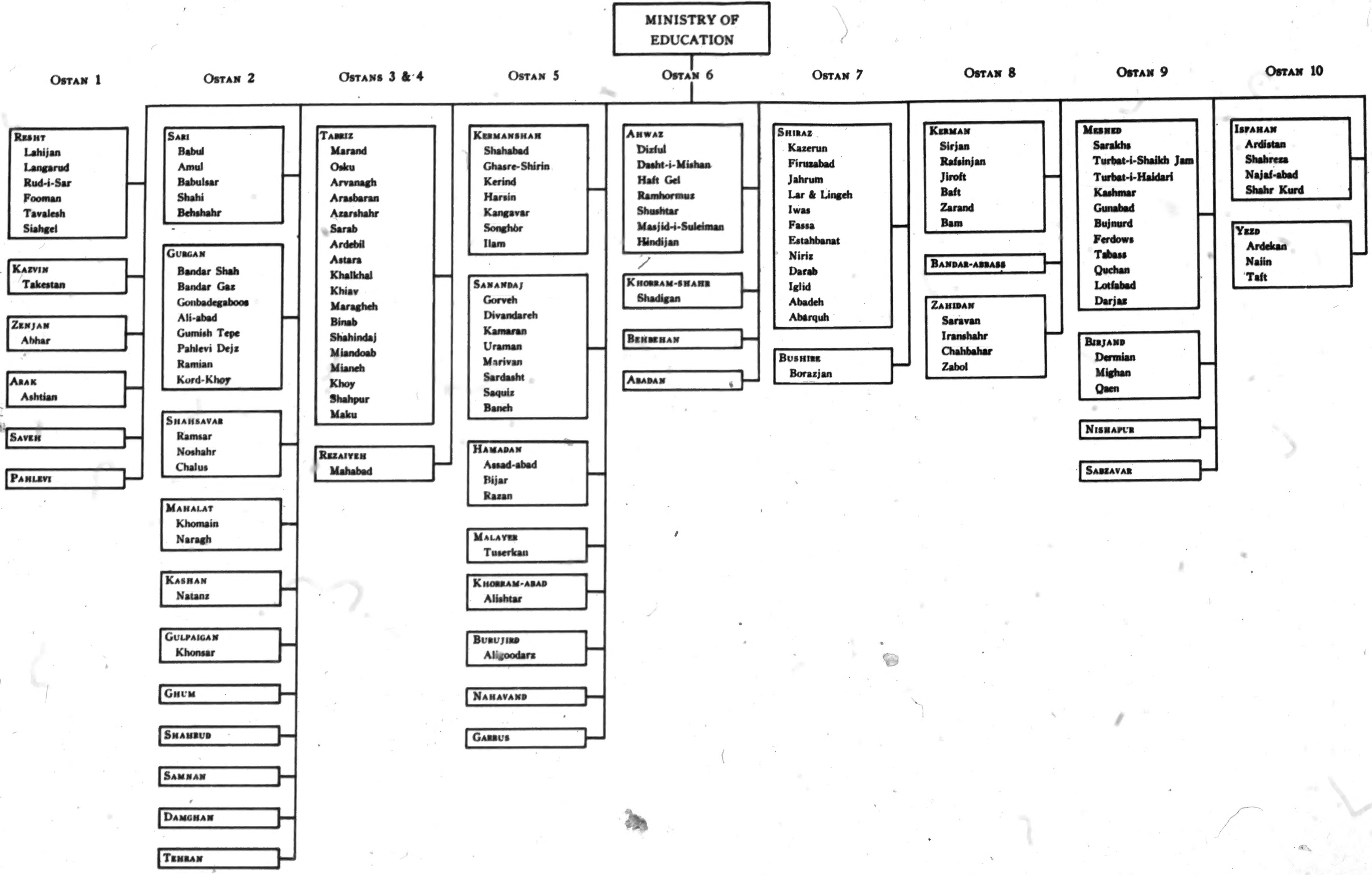
ORGANIZATION OF THE MINISTRY OF EDUCATION
1327–1328


MAJLESS
COUNCIL OF MINISTERS
Minister of Education
Under-secretary of Education
Secretariat of the Ministry
Secretariat of the High Education Council
Educational Director-General
Director-General of Administration
Director-General of Fine Arts
Director-General of Bequests and Pious Foundations
Higher Education and International Cultural Relations Administration
Secretariat of Theological Sciences
Education Department of Tehran and Suburbs
Education Department of the Provinces
Rural Education Department
Adult Education Department
Compulsory Education Department
Examination Department
Personnel Department
Accounts Department
Construction Department
Department of Supplies and Services
Inspection and Supervision Department
Physical Education Department
Paintings Department
Statistics Department
Archaeology Department
National Library Department
Music Department
Museum Department
Bequests Department of Tehran
Bequests Department of the Provinces
Research Department

Source: Ministry of Education.

Exhibit B-2

THE SUBDIVISIONS OF THE EDUCATIONAL SYSTEM

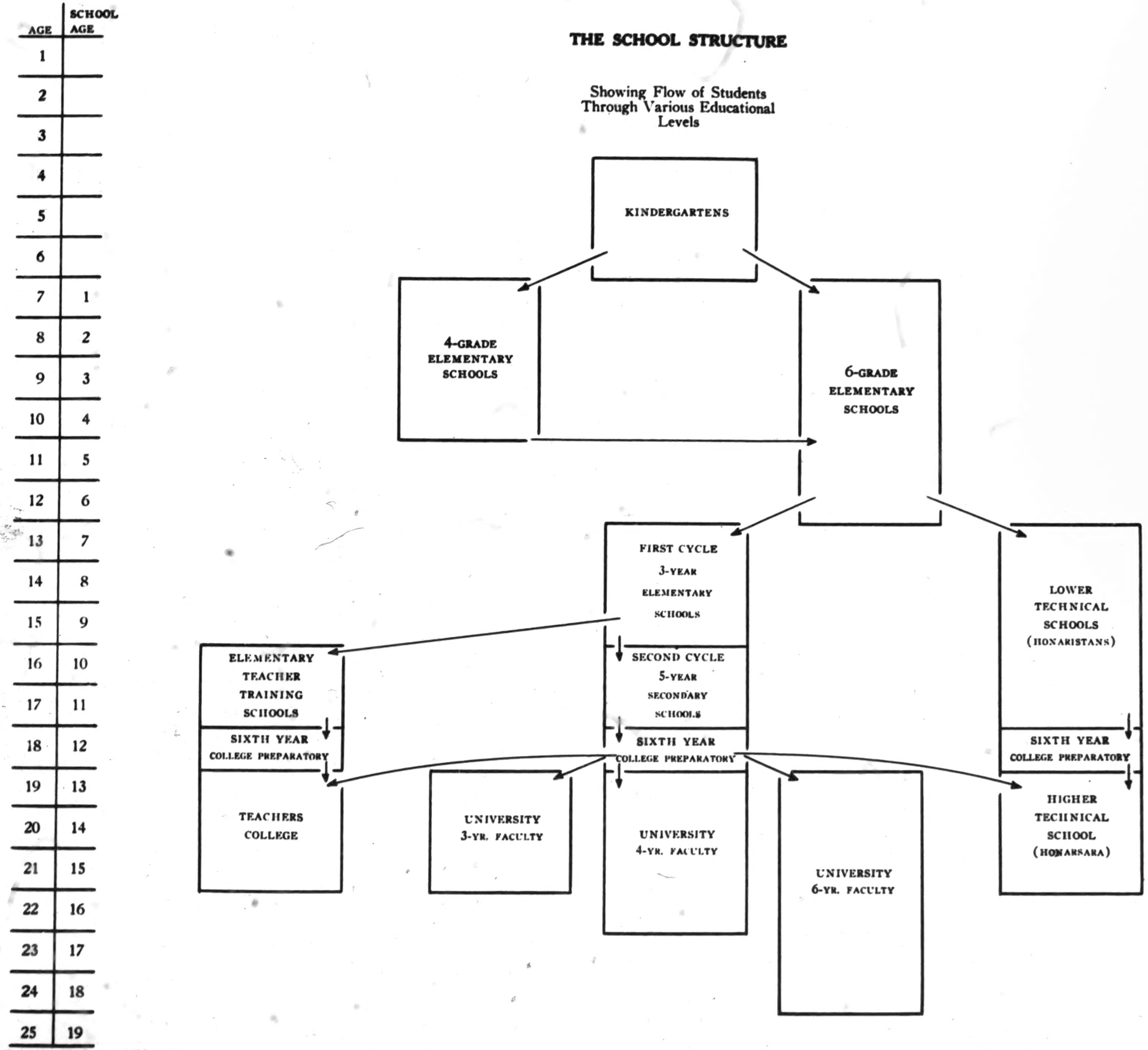

MINISTRY OF EDUCATION
OSTAN 1
RESHT
Lahijan
Langarud
Rud-i-Sar
Fooman
Tavalesh
Siahgel
KAZVIN
Takestan
ZENJAN
Abhar
ARAK
Ashtian
SAVEH
PAHLEVI
OSTAN 2
SARI
Babul
Amul
Babulsar
Shahi
Behshahr
GURGAN
Bandar Shah
Bandar Gaz
Gonbadegaboos
Ali-abad
Gumish Tepe
Pahlevi Dejz
Ramian
Kord-Khoy
SHAHSAVAR
Ramsar
Noshahr
Chalus
MAHALAT
Khomain
Naragh
KASHAN
Natanz
GULPAIGAN
Khonsar
GHUM
SHAHRUD
SAMNAN
DAMGHAN
TEHRAN
OSTANS 3 & 4
TABRIZ
Marand
Osku
Arvanagh
Arasbaran
Azarshahr
Sarab
Ardebil
Astara
Khalkhal
Khiav
Maragheh
Binab
Shahindaj
Miandoab
Mianeh
Khoy
Shahpur
Maku
REZAIYEH
Mahabad
OSTAN 5
KERMANSHAH
Shahabad
Ghasre-Shirin
Kerind
Harsin
Kangavar
Songhor
Ilam
SANANDAJ
Gorveh
Divandareh
Kamaran
Uraman
Marivan
Sardasht
Saquiz
Baneh
HAMADAN
Assad-abad
Bijar
Razan
MALAYER
Tuserkan
KHORRAM-ABAD
Alishtar
BURUJIRD
Aligoodarz
NAHAVAND
GARRUS
OSTAN 6
AHWAZ
Dizful
Dasht-i-Mishan
Haft Gel
Ramhormuz
Shushtar
Masjid-i-Suleiman
Hindijan
KHORRAM-SHAHR
Shadigan
BEHBEHAN
ABADAN
OSTAN 7
SHIRAZ
Kazerun
Firuzabad
Jahrum
Lar & Lingeh
Iwas
Fassa
Estahbanat
Niriz
Darab
Iglid
Abadeh
Abarquh
BUSHIRE
Borazjan
OSTAN 8
KERMAN
Sirjan
Rafsinjan
Jiroft
Baft
Zarand
Bam
BANDAR-ABBASS
ZAHIDAN
Saravan
Iranshahr
Chahbahar
Zabol
OSTAN 9
MESHED
Sarakhs
Turbat-i-Shaikh Jam
Turbat-i-Haidari
Kashmar
Gunabad
Bujnurd
Ferdows
Tabass
Quchan
Lotfabad
Darjaz
BIRJAND
Dermian
Mighan
Qaen
NISHAPUR
SABZAVAR
OSTAN 10
ISFAHAN
Ardistan
Shahreza
Najaf-abad
Shahr Kurd
YEZD
Ardekan
Naiin
Taft

Source: Ministry of Education.

Exhibit B-3

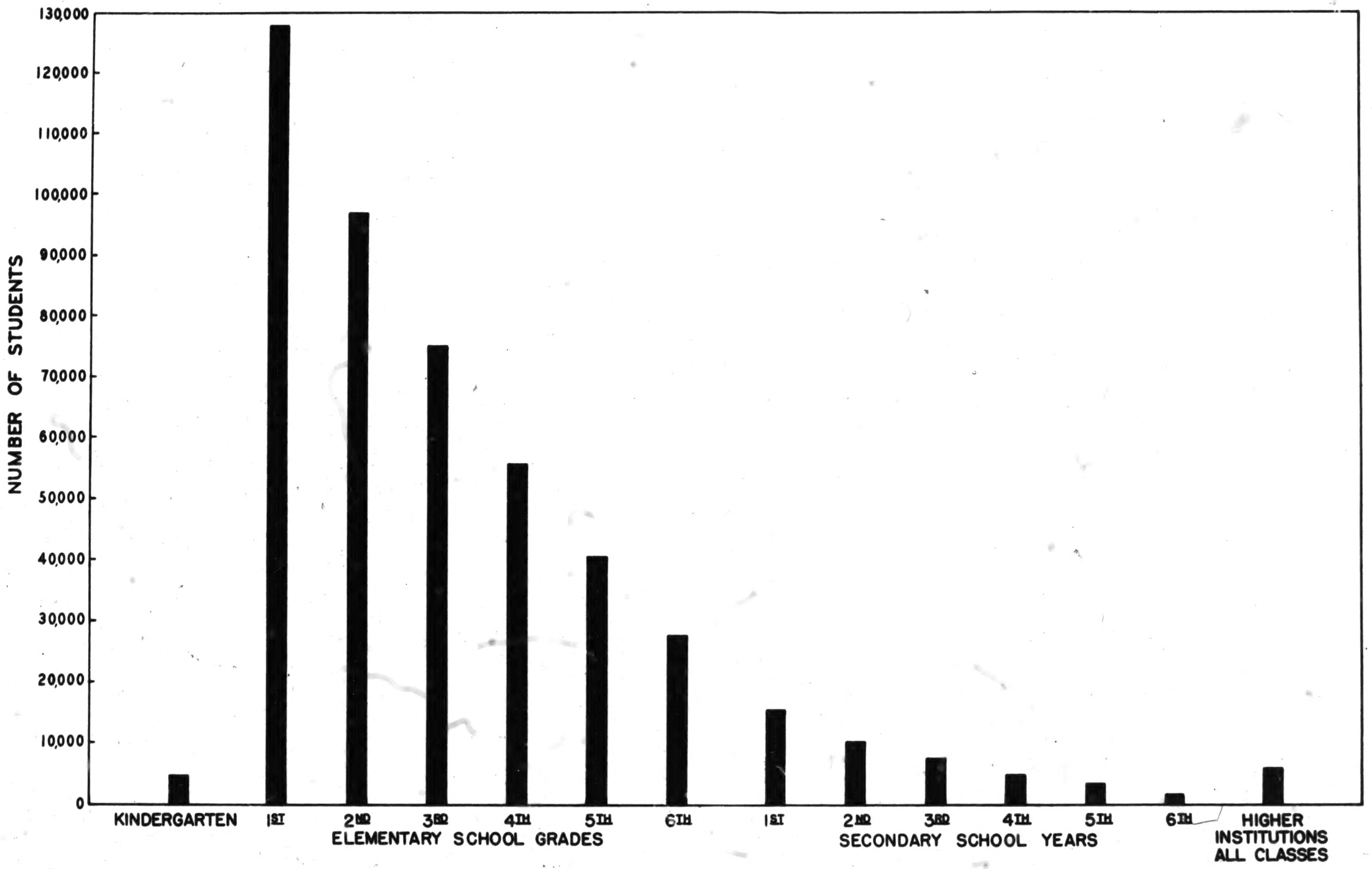
THE SCHOOL STRUCTURE

Showing Flow of Students
Through Various Educational
Levels


AGE
SCHOOL AGE
1
2
3
4
5
6
7 1
8 2
9 3
10 4
11 5
12 6
13 7
14 8
15 9
16 10
17 11
18 12
19 13
20 14
21 15
22 16
23 17
24 18
25 19
KINDERGARTENS
4-GRADE ELEMENTARY SCHOOLS
6-GRADE ELEMENTARY SCHOOLS
FIRST CYCLE 3-YEAR ELEMENTARY SCHOOLS
SECOND CYCLE 5-YEAR SECONDARY SCHOOLS
SIXTH YEAR COLLEGE PREPARATORY
LOWER TECHNICAL SCHOOLS (HONARISTANS)
SIXTH YEAR COLLEGE PREPARATORY
ELEMENTARY TEACHER TRAINING SCHOOLS
SIXTH YEAR COLLEGE PREPARATORY
TEACHERS COLLEGE
UNIVERSITY 3-YR. FACULTY
UNIVERSITY 4-YR. FACULTY
UNIVERSITY 6-YR. FACULTY
HIGHER TECHNICAL SCHOOL (HONARSARA)

Source: Ministry of Education.

EXHIBIT B-4



ATTRITION OF SCHOOL POPULATION
AS INDICATED BY
NUMBER OF STUDENTS IN EACH CLASS
1327 — 1328

SOURCE: MINISTRY OF EDUCATION

OVERSEAS CONSULTANTS, INC.
NEW YORK
1949

Exhibit B-5

STANDARD ELEMENTARY SCHOOL CURRICULUM

BOYS AND GIRLS

	Class Hours per Week					
SUBJECT	FIRST GRADE	SECOND GRADE	THIRD GRADE	FOURTH GRADE	FIFTH GRADE	SIXTH GRADE
Persian (Writing and Ethics)	14	15	12	12	–	–
Arithmetic and Geometry	2	3	4	4	5	4
Drawing	–	3	4	4	1	1
Calligraphy	–	1	2	2	1	1
Physical Training	5	5	5	5	3	3
Singing (Islamic Hymns)	1	1	1	1	1	1
Moral Studies (Islamic)	–	–	–	–	1	1
Reading	–	–	–	–	5	4
Dictation	–	–	–	–	2	2
Composition	–	–	–	–	1	1
Grammar	–	–	–	–	1	1
Natural History	–	–	–	–	2	2
History and Geography	–	–	–	–	2	2
Handicrafts	–	–	–	–	3	3
Scouting (now suspended)	–	–	–	–	–	2
TOTAL	22	28	28	28	28	28

Source: The Ministry of Education.

Exhibit B-6

SECONDARY SCHOOL CURRICULA

BOYS

Class Hours per Week

Subject	First Cycle			Second Cycle	
	First Year	Second Year	Third Year	Fourth Year	Fifth Year
Persian	4	4	4	4	4
Arabaic	2	2	2	2	2
Physics	1	2	2	3	3
Chemistry	1	1	2	2	2
Natural Science and Hygiene	2	2	2	2	2
History	2	2	2	2	2
Geography	2	2	2	2	1
Arithmetic	3	1	–	–	–
Algebra	–	2	2	2	2
Geometry	2	2	2	2	1
Trigonometry	–	–	–	1	1
Drawing	1	1	1	1	1
Astronomy	–	–	–	–	2
Foreign Language	5	4	4	4	4
Sketching	1	1	1	1	1
Calligraphy	1	1	1	–	–
Religious Training (Islamic)	1	1	1	1	1
Physical Training	2	2	2	1	1
TOTAL	30	30	30	30	30

SIXTH YEAR

Subject	College Preparatory		
	Literature Option	Mathematics Option	Physical Science Option
Philosophy	5	–	–
Persian Language and Literature	6	3	3
Arabic	5	–	–
History	3	–	–
Geography	3	–	–
Foreign Language	6	4	6
Mathematics and Drawing	–	11	2
Physics, Chemistry and Mechanics	–	9	6
Natural History	–	–	8
Physical Training	2	2	2
TOTAL	30	29	27

Commercial Option	
Subject	
Persian	2
Foreign Language	5
Commercial Chemistry	1
Advertising	1
Bookkeeping	3
Commercial Mathematics	2
Commercial Letter Writing	2
Trade	3
Economics	2
Economic Geography	2
Commercial Law and Civics	3
Typing	2
Physical Training	2
TOTAL	30

Source: The Ministry of Education.

Exhibit B-7

SECONDARY SCHOOL CURRICULA

GIRLS

Class Hours per Week

	First Cycle			Second Cycle					
				Fourth Year			Fifth Year		
Subject	First Year	Second Year	Third Year	Lessons	Exercises	Total	Lessons	Exercises	Total
Persian	4	4	4	4	–	4	4	–	4
Foreign Language	6	5	5	4	–	4	4	–	4
Physics	1	2	2	1	1	2	1	1	2
Chemistry	1	2	2	1	1	2	1	1	2
Natural Science and Hygiene	2	2	2	1	1	2	1	1	2
History	2	2	2	–	–	–	–	–	–
Geography	2	2	2	–	–	–	–	–	–
Arabic	2	2	2	–	–	–	–	–	–
Arithmetic	3	1	–	–	–	–	–	–	–
Geometry and Drawing	2	2	2	–	–	–	–	–	–
Algebra	–	2	3	–	–	–	–	–	–
Ethics and Etiquette	–	–	–	1	–	1	1	–	1
Psychology	–	–	–	–	–	–	1	–	1
Home Economics	3	2	2	1	3	4	1	1	2
Sketching	1	1	1	–	1	1	–	1	1
Sewing	2	2	2	1	3	4	1	2	3
Cooking	–	–	–	1	3	4	1	3	4
Child Care	–	–	–	2	–	2	2	–	2
Nursing	–	–	–	–	–	–	2	–	2
Music	–	–	–	1	–	1	1	–	1
Religious Instruction (Islamic)	1	1	1	–	1	1	–	1	1
Physical Training[a]	2	2	2	–	1	1	–	1	1
Handicrafts	–	–	–	–	1	1	–	1	1
Total	34	34	34	18	16	34	21	13	34

[a] In addition to hours listed, at least two hours per week should be spent in sports outside the program.

Source: The Ministry of Education.

Exhibit B-8

CURRICULUM OF THE TEACHER TRAINING SCHOOL

MEN

Class Hours per Week

Subject	First Year	Second Year
Psychology, Culture, Ethics and Education	3	2
Persian Language and Literature	4	3
Arabic	2	2
Foreign Language	4	4
History	1	1
Geography	1	1
Mathematics	4	3
Physics and Chemistry	3	3
Natural Science	2	2
Hygiene and Public Health	1	–
Mechanical Drawing and Sketching	1	1
Music and Songs	2	2
Scouting and Physical Training	2	2
Farming and Handicrafts	2	2
Teaching Exercises	–	5
Total	32	33

Source: The Ministry of Education.

Exhibit B-9

CURRICULUM OF THE TEACHER TRAINING SCHOOL

WOMEN

Class Hours per Week

SUBJECT	FIRST YEAR	SECOND YEAR
Psychology, Culture, Education and Mathematics	3	2
Persian Language and Literature	4	3
Arabic	2	2
Foreign Language	4	4
History	1	1
Geography	1	1
Mathematics	4	3
Physics and Chemistry	3	3
Natural Science	2	2
Hygiene and Child Care	1	1
Mechanical Drawing and Sketching	1	1
Music and Songs	2	2
Scouting and Physical Training	2	2
Handicrafts	1	1
Home Economics and Sewing	2	2
Teaching Exercises	–	5
TOTAL	33	35

Source: The Ministry of Education.

Exhibit B-10

CURRICULA OF THE HONARISTAN IN TEHRAN

Class Hours per Week

METALWORK SECTION

Subject	FIRST YEAR	SECOND YEAR	THIRD YEAR	FOURTH YEAR	FIFTH YEAR		SIXTH YEAR	
					Mechanics	Electricity	Mechanics	Electricity
Persian	5	4	4	4	2	2	2	2
German	4	4	4	2	2	2	2	2
Mathematics	4	4	2	4	2	2	–	–
Chemistry and Physics	2	3	3	2	2	2	–	–
Physical Training	2	2	2	2	2	2	2	2
Hygiene	–	–	–	–	1	1	1	1
Applied Arithmetic	2	2	3	3	3	2	3	2
Weights and Measures	2	2	3	3	3	6	3	6
Mechanical Drawing	4	4	4	4	4	4	4	4
Shopwork	14	15	15	16	21	19	25	23
History and Geography	3	2	2	2	–	–	–	–
TOTAL	42	42	42	42	42	42	42	42

WOODWORK SECTION

Subject	FIRST YEAR	SECOND YEAR	THIRD YEAR	FOURTH YEAR	FIFTH YEAR	SIXTH YEAR
Persian	5	4	4	4	2	2
German	4	4	4	2	2	2
Mathematics	4	4	2	4	2	–
Chemistry and Physics	2	3	3	2	–	–
Physical Training	2	2	2	2	2	2
Hygiene	–	–	–	–	1	1
Applied Arithmetic	2	2	2	2	2	2
Weights and Measures	4	2	2	2	3	3
Mechanical Drawing	4	4	4	4	4	4
Shopwork	12	15	17	18	24	26
History and Geography	3	2	2	2	–	–
TOTAL	42	42	42	42	42	42

Source: The Plan Organization.

CURRICULA OF THE FACULTY OF ENGINEERING

ALL BRANCHES

First Year

SUBJECT	THEORY 1½ Hr. Sessions	PROBLEMS AND LABORATORY 1½ Hr. Sessions
Algebra and Analytical Mathematics	61	19
Geometry and Analytical Geometry	46	18½
Mechanics	46	18½
Physics (Heat, Light, Electricity)	78	31
Chemistry	62	18
Mechanical Drawing	3	20
Shopwork	–	13
Sketching	–	10
TOTAL	296	148

ELECTRICAL AND MECHANICAL ENGINEERING

Second Year

SUBJECT	THEORY 1½ Hr. Sessions	PROBLEMS, FIELD AND LABORATORY 1½ Hr. Sessions
Applied Mechanics	45	28
Mathematical Analysis	33	6
Thermo-Dynamics	20	6
Mechanical Drawing	18	2
Calculus	11	1
Drawing	–	45
Physics	48	12
Architecture	25	10
Strength of Materials	42	20
Mechanics	32	7
Surveying	24	7
Descriptive Geometry	18	5
TOTAL	316	149

Third Year

SUBJECT	THEORY 1½ Hr. Sessions	PROBLEMS, FIELD AND LABORATORY 3 Hr. Sessions
Economics	17	-
Applied Electricity	75	6
Thermo-Dynamics	15	5
Steel Structures	20	10
Construction Methods	24	1
Machine Tools	38	14
Steam Engines	38	19
Engine Design	36	31
Metallurgy and Industrial Materials	50	2
Internal Combustion Engines, Compressors and Refrigerators	29	27
Hydraulics	36	3
TOTAL	378	118

Fourth Year

SUBJECT	THEORY 1½ Hr. Sessions	PROBLEMS, FIELD AND LABORATORY 3 Hr. Sessions
Electricity Applied to Industry	18	15
Applied Electricity	40	5
Use of Machine Tools	22	29
Law and Administrative Organization	20	-
Design of Electrical Machinery	36	15
Advanced Physics	28	-
Machine Design	-	13
Internal Combustion Engines	-	10
Electrical Transmission	14	-
TOTAL	178	87

HIGH TENSION SECTION

	1½ Hr. Sessions	1½ Hr. Sessions
Electrical Measurements	20	10
Electrical Design	30	2
Wiring and Lighting	20	13
Industrial Electricity	20	-
Electrical Transmission and Distribution	30	13
Factory Design	30	16
TOTAL	150	54

Fourth Year—Continued

LOW TENSION SECTION

	1½ Hr. Sessions	1½ Hr. Sessions
Radio Electricity	48	12
Radio	44	11
Telephone and Telegraph	50	14
Electrical Measurements	20	10
TOTAL	162	47

TRACTION SECTION

	1½ Hr. Sessions	1½ Hr. Sessions
Railroads	46	10
Railroad Equipment	44	22
Drilling and Agricultural Machinery	22	2
Factory Organization	22	–
Construction Designs	30	12
TOTAL	164	46

CIVIL ENGINEERING

Second Year

SUBJECT	THEORY	PROBLEMS, FIELD AND LABORATORY
	1½ Hr. Sessions	3 Hr. Sessions
Applied Mechanics	30	4
Mathematical Analysis	33	6
Graphics	18	3
Calculus	11	2
Drawing	–	25
Geology	22	4
Road Surfaces	26	16
Stone Identification	14	7
Construction Methods	40	–
Construction Materials	34	2
Architecture	25	12
Strength of Materials	42	19
Mechanics	19	6
Surveying	24	17
Descriptive Geometry	18	13
TOTAL	356	136

Exhibit B-11

Third Year

SUBJECT	THEORY 1½ Hr. Sessions	PROBLEMS, FIELD AND LABORATORY 3 Hr. Sessions
Economics	17	–
Reinforced Concrete	12	2
Construction Estimates	6	15
Thermo-Dynamics	20	4
Railroads	40	13
Road Foundations	26	16
Steel Structures	12	–
Construction Methods	40	–
Hydraulic Machines	24	6
Strength of Materials	58	24
Architecture	40	30
Surveying	40	32
TOTAL	335	142

Fourth Year

SUBJECT	THEORY 1½ Hr. Sessions	PROBLEMS, FIELD AND LABORATORY 3 Hr. Sessions
Materials Testing	–	4
Reinforced Concrete	50	23
Foundations	10	1
Law and Administrative Organization	20	–
Railroads	34	2
Road Surfaces	34	–
Wood Structures	12	–
Marine Construction	38	12
Heavy Construction	26	12
Steel Structures	24	12
Town Planning	18	13
Construction Methods	40	–
Heat Engines	40	5
Hydraulic Machinery	20	4
Hydraulics	–	12
Architecture	4	18
TOTAL	370	118

Exhibit B-11
Page 5 of 7

CHEMICAL ENGINEERING

Second Year

SUBJECT	THEORY 1½ Hr. Sessions	PROBLEMS, FIELD AND LABORATORY 3 Hr. Sessions
Applied Mechanics	30	5
Calculus	11	–
Drawing	–	10
Analytical Chemistry	60	–
Physico-Chemistry	58	7
Inorganic Chemistry	80	32
Applied Chemistry (Analytical, Qualitative and Quantitative Analysis)	–	89
Mineralogy	24	15
Architecture	23	–
Physics	21	4
TOTAL	307	162

Third Year

SUBJECT	THEORY 1½ Hr. Sessions	PROBLEMS, FIELD AND LABORATORY 3 Hr. Sessions
Economics	17	–
Applied Electricity	43	8
Technology	65	5
Analytical Chemistry	60	–
Physico-Chemistry	30	11
Industrial Chemistry	70	17
Applied Chemistry (Analytical, Qualitative and Quantitative Analysis)	14	77
Heat Engines	20	5
Hydraulics	34	3
TOTAL	353	126

Exhibit B-11

Fourth Year

SUBJECT	THEORY 1½ Hr. Sessions	PROBLEMS, FIELD AND LABORATORY 3 Hr. Sessions
Law	19	–
Factory Design	19	–
Analytical Chemistry	–	31
Biological and Agricultural Chemistry	74	32
Physico-Chemistry	20	5
Analytical Industrial Chemistry	60	44
Inorganic Chemistry	30	–
Metallurgy	40	1
Elective Subjects	90	16
TOTAL	352	129

MINING ENGINEERING

Second Year

SUBJECT	THEORY 1½ Hr. Sessions	PROBLEMS, FIELD AND LABORATORY 3 Hr. Sessions
Mathematical Analysis	33	6
Applied Mechanics	30	4
Graphics	18	3
Calculus	11	1
Drawing	–	25
Analytical Chemistry	15	24
Fossology	20	25
Mineralogy	40	27
Strength of Materials	42	20
Architecture	25	10
Surveying	24	19
Physico-Chemistry	20	5
TOTAL	278	169

Exhibit B-11

Page 7 of 7

Third Year

SUBJECT	THEORY 1½ Hr. Sessions	PROBLEMS, FIELD AND LABORATORY 3 Hr. Sessions
Mining	42	7
Economics	17	–
Road Construction	16	–
Geology	10	25
Construction	20	8
Analytical Chemistry	15	24
Mineralogy	40	25
Industrial Thermo-Dynamics	20	5
Metallurgy	50	14
Surveying	40	30
Fossology	20	25
TOTAL	290	163

Source: The Plan Organization.

Exhibit B-12

CURRICULA OF THE FACULTY OF SCIENCE

PHYSICS SECTION

	FIRST YEAR		SECOND YEAR		THIRD YEAR	
	Hours per Week	Sessions per Week	Hours per Week	Sessions per Week	Hours per Week	Sessions per Week
SUBJECT	THEORY	LABORATORY	THEORY	LABORATORY	THEORY	LABORATORY
General Mathematics	6	1	–	–	–	–
Physics	2	1	8	1	8	2
Chemistry	4	1	–	–	–	–
Foreign Language	3	–	–	–	–	–
Mechanics	–	–	4	1	4	1
Mathematics	–	–	1	–	1	–
TOTAL	15	3	13	2	13	3

CHEMISTRY SECTION

	FIRST YEAR		SECOND YEAR		THIRD YEAR	
	Hours per Week	Sessions per Week	Hours per Week	Sessions per Week	Hours per Week	Sessions per Week
SUBJECT	THEORY	LABORATORY	THEORY	LABORATORY	THEORY	LABORATORY
Physics	6	1	–	–	–	–
General Mathematics	4	–	–	–	–	–
Chemistry	3	1	2	2	–	–
Foreign Language	3	–	–	–	–	–
Inorganic Chemistry	–	–	3	3	2	–
Analytical Chemistry	–	–	2	–	3	1
Physico-Chemistry	–	–	3	–	2	1
Industrial Chemistry	–	–	2	–	2	1
Bio-Chemistry	–	–	–	–	2	–
Mineralogy	–	–	–	–	1	–
TOTAL	16	2	12	5	12	3

Exhibit B-12

MATHEMATICS SECTION

	FIRST YEAR		SECOND YEAR		THIRD YEAR	
	Hours per Week	Sessions per Week	Hours per Week	Sessions per Week	Hours per Week	Sessions per Week
SUBJECT	THEORY	LABORATORY	THEORY	LABORATORY	THEORY	LABORATORY
General Mathematics	12	1	–	–	–	–
Foreign Language	3	–	–	–	–	–
Mathematical Analysis	–	–	3	–	7	–
Mechanics	–	–	4	–	6	–
Descriptive Geometry	–	–	6	–	–	–
Astronomy	–	–	3	–	3	–
Advanced Geometry	–	–	–	–	2	–
TOTAL	15	1	16	–	18	–

NATURAL SCIENCE SECTION

	FIRST YEAR		SECOND YEAR		THIRD YEAR	
	Hours per Week	Sessions per Week	Hours per Week	Sessions per Week	Hours per Week	Sessions per Week
SUBJECT	THEORY	LABORATORY	THEORY	LABORATORY	THEORY	LABORATORY
Zoology	2	–	2	1	2	1
Botany	3	1	3	1	3	–
Biology	2	–	2	1	2	–
Geology	2	–	4	1	4	1
Foreign Languages	6	–	–	–	–	–
Physiology	–	–	4	1	3	1
TOTAL	15	1	15	5	14	3

Source: The Plan Organization.

Exhibit B-13

CURRICULUM OF THE FACULTY OF AGRICULTURE AT KARAJ

Class Hours per Week

SUBJECT	FIRST YEAR	SECOND YEAR	THIRD YEAR
Agronomy	3	3	–
Mathematics	3	–	–
Zoology	3	–	–
Chemistry	3	2	–
Animal Husbandry	2	2	2
Botany	2	2	–
Foreign Language	2	–	–
Physics and Meteorology	2	–	–
Public Hygiene	1	–	–
Horticulture	1	1	2
Economics	1	1	–
Agricultural Engineering	–	2	2
Genetics	–	2	1
Mechanics	–	2	2
Entomology	–	2	–
Forestry	–	1	2
Rural Industries	–	1	2
Plant Protection from Pests	–	1	2
Phenopathology	–	–	2
Plant Breeding	–	–	2
TOTAL	23	22	19

DAILY FIELD WORK

FIRST YEAR: Horticulture, Botany, Hygiene, Chemistry Laboratory, Animal Husbandry, Zoology and Meteorology.

SECOND YEAR: Agricultural Engineering, Chemistry Laboratory, Entomology, Mechanics, Animal Husbandry, Foreign Language, Horticulture, Rural Industries, Plant Protection.

THIRD YEAR: Agricultural Engineering, Horticulture, Plant Protection, Forestry, Agronomy, Mechanics, Pheno-pathology, Animal Husbandry, Rural Industries.

NOTE: In addition to the normal program indicated, practical work in horticulture, rural industries, protection of plants from pests and diseases, and agricultural engineering is conducted during the holidays.

Source: Faculty of Agriculture.

Exhibit B-14

CURRICULUM OF THE FACULTY OF VETERINARY MEDICINE

FIRST YEAR

Ossology
Biology
Chemistry
Physics
Botany
Nutrition
Agricultural Works
Livestock Judging
French
Practical Laboratory and Field Work

SECOND YEAR

Anatomy and Dissection
Physiology
Histology
General Animal Husbandry
Biological Chemistry
Toxicology, Pharmaceutical Sciences and Materia Medica
French
Practical Laboratory and Field Work

THIRD YEAR

Pathology and Pathological Anatomy
Internal Diseases
External Diseases
Surgery
Parasitology
Birds' and Ruminants' Diseases
Midwifery
Bacteriology and Serology
Animal Hygiene and Inoculation
Symptomatology
Radiology
Pharmaco-Dynamics
Dispensary
Practical Laboratory and Field Work

FOURTH YEAR

Infectious Diseases of Animals
Surgery and External Diseases
Internal Diseases
Parasitology, Parasitic and Skin Diseases
Study of Fish
Milk Hygiene
Study of Alimentary Organs
Special Animal Husbandry
Genetics
Veterinary Laws and History of Veterinary Medicine
Rural Economy
Human Hygiene and Native Diseases of Iran
Dispensary
Practical Laboratory and Field Work

Source: The Plan Organization.

Exhibit B-15

SALARIES OF TEACHERS AND OTHER EDUCATIONAL OFFICIALS
(1327)

(Rials per Month)

GRADE	ELEMENTARY SCHOOL		SECONDARY SCHOOL TEACHERS (DABIRS)	ADMINISTRATIVE EMPLOYEES			ASSISTANT PROFESSORS	PROFESSORS	MEDICAL DOCTORS		PHYSICIANS' ASSISTANTS	HOSPITAL PHYSICIANS	JUDGES
	Assistant Teachers	Teachers (Amoozgars)		First Stage	Second Stage	Third Stage			First Rank	Second Rank			
1	640	960	1,920	640	700	740	2,880	3,160	1,840	1,040	640	2,370	1,000
2	800	1,200	2,160	840	900	980	3,160	3,470	2,220	1,300	840	2,600	2,140
3	1,000	1,500	2,430	1,040	1,120	1,200	3,470	3,810	2,640	1,620	1,120	2,850	1,540
4	1,250	1,870	2,730	1,360	1,480	1,500	3,810	4,190	3,170	2,010	1,480	3,140	1,920
5	1,500	2,240	3,070	1,840	2,000	2,100	4,190	4,600	3,770	2,390	1,960	3,470	2,300
6	1,800	2,680	3,450	2,360	2,510	2,660	4,600	5,060	4,460	2,850	2,450	3,770	2,750
7	2,160	3,210	3,880	2,960	3,150	3,360	5,060	5,560	5,030	3,240	–	4,110	3,200
8	2,590	3,850	4,360	3,650	3,870	4,080	5,560	6,110	5,700	3,660	–	4,500	3,910
9	3,100	4,490	4,900	4,350	4,350	4,900	6,120	6,720	6,470	4,100	–	5,200	4,630
10	3,720	5,050	5,510	–	–	–	6,730	7,390	–	–	–	6,000	5,520
11	–	–	–	–	–	–	–	–	–	–	–	–	6,600

NOTES: Teachers and officials who are sent to rural areas (i.e. "out of centers") receive an allowance ranging from 20% to 150% of the basic salary. Teachers and officials who are sent to areas where the climate is bad are paid a "bad climate allowance" of from 20% to 25% of the basic salary. However, it should be noted that teachers and officials who are employed locally and are residents of the bad climate area do not receive this increment. The classification of districts for both of these salary increments is established by regulation of the Ministry of Education.

Because of the increased cost of living during the World War II a number of "wartime" increments or cost-of-living allowances were established which are still in effect, but are not included in figures above. The increments are:

To the first Rls. 1,000 of the basic salary	80%
To the second Rls. 1,000 of the basic salary	50%
To the third through the eighth Rls. 1,000 of the basic salary	25%

Source: The Ministry of Education.

Exhibit B-16

DISTRIBUTION OF POPULATION IN EACH OSTAN

Ostan	No. of Counties	No. of Village Groupings	No. of Villages	Population	Area (in sq km)	Density of Population	No. of Districts
1	9	93	4,077	1,700,000	72,265	23.5	30
2*	15	118	5,032	3,350,000	168,680	19.9	49
3 & 4	9	150	6,535	2,800,000	99,297	28.2	32
5	9	98	5,624	1,950,000	89,099	21.9	36
6	8	84	4,466	1,700,000	118,392	14.4	34
7	8	86	3,320	1,300,000	161,603	8.0	31
8	7	89	3,593	950,000	361,542	2.6	27
9	11	110	5,786	2,450,000	334,923	7.3	40
10	5	64	2,112	1,550,000	216,065	7.2	24
TOTAL	81	892	40,545	17,750,000	1,621,866	10.9	303

* INCLUDING TEHRAN

Source: Statistics of the General Census Administration. Population figures revised.

Exhibit B-17

COMPARATIVE EDUCATIONAL STATISTICS

(1301-1325)

SCHOOL YEAR	NUMBER OF INSTITUTIONS			NUMBER OF STUDENTS			NUMBER OF GRADUATES			NUMBER OF TEACHERS AND PROFESSORS		
	PRIMARY SCHOOLS	SECONDARY SCHOOLS	HIGHER INSTITUTIONS	PRIMARY SCHOOLS	SECONDARY SCHOOLS	HIGHER INSTITUTIONS	PRIMARY SCHOOLS	SECONDARY SCHOOLS	HIGHER INSTITUTIONS	PRIMARY SCHOOLS	SECONDARY SCHOOLS	HIGHER INSTITUTIONS
1301-02	440	46	1	43,025	9,308	91	595	220	15	(U)	(U)	(U)
1302-03	63	2	2	55,678	12,540	227	2,058	289	28	(U)	(U)	(U)
1303-04	648	86	2	55,960	17,793	273	1,896	573	61	(U)	(U)	(U)
1304-05	(U)	(U)	(U)	(U)	(U)	(U)	2,217	540	89	(U)	(U)	(U)
1305-06	648	60	3	52,792	(U)	(U)	2,876	789	73	(U)	(U)	(U)
1306-07	(U)	(U)	(U)	(U)	(U)	(U)	3,140	188	77	(U)	(U)	(U)
1307-08	923	158	3	138,204	9,017	279	3,643	863	43	4,160	1,150	53
1308-09	1,000	141	3	112,485	10,061	316	3,593	1,584	34	5,192	1,084	47
1309-10	1,048	150	3	126,052	11,452	830	5,633	949	68	5,601	1,180	52
1310-11	1,123	161	3	131,450	12,494	561	5,417	426	74	5,450	1,307	60
1311-12	1,186	156	3	141,103	13,120	692	6,536	1,289	115	5,364	1,361	64
1312-13	1,194	154	6	150,859	13,637	901	7,253	978	86	5,467	1,337	95
1313-14	1,301	166	8	167,672	14,509	1,236	8,884	748	155	5,983	1,292	139
1314-15	1,336	180	12	170,077	16,294	1,645	9,962	839	305	6,805	1,396	203
1315-16	1,442	227	10	210,322	21,785	1,993	13,806	1,118	367	6,738	1,653	242
1316-17	1,546	295	11	243,039	25,494	2,218	16,233	1,086	321	7,460	2,094	273
1317-18	1,594	300	14	262,175	26,551	2,238	15,830	4,149	452	7,770	1,998	283
1318-19	1,691	316	12	264,727	26,848	2,439	17,541	4,550	516	8,129	2,235	377
1319-20	2,336	351	12	287,245	28,196	3,395	20,036	2,708	610	9,269	2,249	566
1320-21	2,426	332	12	253,838	25,410	3,367	18,313	2,859	374	9,637	2,327	412
1321-22	2,401	320	12	244,315	26,812	3,405	17,158	3,175	536	9,748	2,340	381
1322-23	2,381	330	11	238,330	24,726	3,449	17,733	3,139	426	10,149	2,554	359
1323-24	2,428	304	10	258,480	28,611	3,847	15,673	3,631	518	11,032	2,608	403
1324-25	2,531	288	13	287,905	29,047	4,218	15,609	3,877	(U)	11,710	2,723	690

Source: The Plan Organization. (U)—Unknown

Exhibit B-18

BUDGET OF THE MINISTRY OF EDUCATION
(1326-1328)*

	1326	1327	1328
Salaries of Administrations (including the Ministry of Education and schools in Tehran	Rls. 111,297,343	Rls. 135,946,640	—
Expenditure of Administration (including the Ministry of Education and schools in Tehran	65,003,511	68,355,360	Rls. 744,890,360
Salaries of officials in the offices of the Provincial Education Departments	230,929,120	284,795,920	—
Expenditure of the offices of the Provincial Education Department, and schools under these offices	122,282,026	120,416,080	—
The University of Tabriz	6,000,000	16,000,000	20,000,000
Students sent to study in foreign countries	2,500,000	2,500,000	2,500,000
TOTAL	Rls. 538,012,000	Rls. 628,014,000	Rls. 767,390,360

* NOTE: Because there has been no national budget approved during these years, the figures given are the actual expenditures. The accounting system of the Ministry of Education does not permit the preparation of a detailed budget showing expenditures for construction, maintenance, salaries, recurring and non-recurring expenditures for supplies. Budget allotments are made to administrative areas and, within the over-all grant, no real budget control is exercised.

Source: The Ministry of Education.

Exhibit B-19

MINISTRY OF EDUCATION GRANTS TO THE LOCAL EDUCATIONAL DISTRICTS AUTHORIZED IN THE BUDGET OF 1328

	Total for Municipalities	Total for Shahristans	Total for Ostans
OSTAN 1			Rls. 46,630,670
Resht		Rls. 22,328,420	
Lahijan	Rls. 1,823,640		
Langarud	1,272,930		
Rud-i-Sar	901,830		
Fooman	1,177,000		
Tavalesh	892,580		
Siahgel	420,060		
Resht	15,840,380		
Kazvin		7,163,660	
Takestan	237,220		
Kazvin	6,926,440		
Zenjan		4,128,400	
Abhar	772,630		
Zenjan	3,355,770		
Arak		6,954,450	
Ashtian	569,610		
Arak	6,384,840		
Saveh		2,299,600	
Saveh	2,299,600		
Pahlevi		3,756,140	
Pahlevi	3,756,140		
OSTAN 2			212,587,590
Sari		12,304,500	
Babul	2,882,100		
Amul	1,984,000		
Babul-Sar	727,040		
Shahi	1,664,480		
Behshahr	748,980		
Sari	4,297,900		
Gurgan		7,825,460	
Bandar Shah	516,160		
Bandar Gaz	671,120		
Gonbadegaboos	890,120		
Ali-Abad	212,720		
Gumish-Tepe	593,060		
Pahlevi Dejz	239,920		
Ramian	187,880		
Kord-Khoy	394,740		
Gurgan	4,119,740		
Shahsavar		4,599,660	
Ramsar	368,980		
Noshahr	762,780		
Chalus	414,260		
Shahsavar	3,053,640		

	Total for Municipalities	Total for Shahristans	Total for Ostans
MAHALAT		Rls. 2,436,240	
Khomain	Rls. 787,160		
Naragh	437,040		
Mahalat	1,212,040		
GHUM		3,980,540	
Ghum	3,980,540		
KASHAN		4,169,580	
Natanz	566,920		
Kashan	3,602,660		
GULPAIGAN		2,885,560	
Khonsar	667,660		
Gulpaigan	2,217,900		
SHAHRUD		3,288,460	
Shahrud	3,288,460		
DAMGHAN		1,829,510	
Damghan	1,829,510		
SAMNAN		3,638,760	
Samnan	3,638,760		
TEHRAN		165,629,320	
Tehran	165,629,320		
OSTANS 3 and 4			Rls. 62,682,470
TABRIZ		50,155,210	
Marand	1,522,580		
Osku	1,093,320		
Arvanagh	1,457,420		
Azarshahr	915,880		
Sarab	703,580		
Arasbaran	1,265,860		
Ardebil	4,893,810		
Astara	1,777,540		
Khalkhal	809,510		
Khiav	889,850		
Maragheh	3,389,090		
Binab	393,900		
Shahindaj	626,300		
Mianduab	1,049,440		
Mianeh	1,279,140		
Khoy	4,237,620		
Shahpur	1,585,480		
Maku	1,229,560		
Tabriz	21,035,330		
REZAIYEH		12,527,260	
Mahabad	2,124,710		
Rezaiyeh	10,402,550		

Exhibit B-19

	TOTAL FOR MUNICIPALITIES	TOTAL FOR SHAHRISTANS	TOTAL FOR OSTANS
OSTAN 5			Rls. 44,503,010
KERMANSHAH		Rls. 11,221,180	
Shahabad	Rls. 473,430		
Ghasre-Shirin	679,160		
Kerind	285,860		
Harsin	113,300		
Kangavar	516,530		
Songhor	572,120		
Ilam	659,980		
Kermanshah	7,920,800		
SANANDAJ		7,643,570	
Gorveh	411,300		
Divandareh	362,900		
Kamaran	260,180		
Uraman	699,620		
Marivan	343,420		
Sardasht	330,460		
Saqiz	965,460		
Baneh	440,660		
Sanandaj	3,829,570		
HAMADAN		10,667,810	
Assad-abad	659,950		
Bijar	1,118,530		
Razan	1,027,810		
Hamadan	7,861,520		
MALAYER		4,027,330	
Tuserkan	793,510		
Malayer	3,233,820		
KHORRAM-ABAD		3,017,070	
Alishtar	368,670		
Khorram-abad	2,648,400		
BURUJIRD		4,859,630	
Aligoodarz	1,005,030		
Burujird	3,854,600		
NAHAVAND		1,172,420	
Nahavand	1,172,420		
GARRUS		1,894,000	
Garrus	1,894,000		
OSTAN 6			25,593,470
AHWAZ		13,607,470	
Dizful	1,404,900		
Dasht-i-Mishan	857,580		
Haft-Gel	603,980		
Ramhormuz	675,260		

Exhibit B-19

	Total for Municipalities	Total for Shahristans	Total for Ostans
Shushtar	Rls. 737,080		
Masjid-i-Suleiman	1,496,210		
Hindijan	207,170		
Ahwaz	7,625,290		
KHORRAM-SHAHR		Rls. 2,763,730	
Shadigan	421,170		
Khorram-shahr	2,342,560		
ABADAN		7,256,200	
Abadan	7,256,200		
BEHBEHAN		1,966,070	
Behbehan	1,966,070		
OSTAN 7			Rls. 39,236,330
SHIRAZ		34,788,370	
Kazerun	1,127,440		
Firuzabad	438,940		
Jahrum	1,661,800		
Lar and Lingeh	2,006,340		
Iwas	312,470		
Fassa	1,478,660		
Estahbanat	986,960		
Niriz	1,017,420		
Darab	705,620		
Abadeh	2,456,340		
Iqlid	328,380		
Abaquh	305,140		
Shiraz	21,962,860		
BUSHIRE		4,447,960	
Borazjan	729,340		
Bushire	3,718,620		
OSTAN 8			27,907,210
KERMAN		18,684,820	
Sirjan	2,014,220		
Rafsinjan	1,943,240		
Bam	2,185,530		
Jiroft	786,060		
Baft	1,247,570		
Zarand	1,125,320		
Kerman	9,382,880		
BANDAR-ABBASS		2,908,580	
Bandar-Abbass	2,908,580		

Exhibit B-19

	Total for Municipalities	Total for Shahristans	Total for Ostans
Zahidan		Rls. 6,313,810	
Saravan	Rls. 659,080		
Chahbahar	283,460		
Zabol	1,894,230		
Bampur (Iranshahr)	734,000		
Zahidan	2,743,040		
OSTAN 9			Rls. 41,767,650
Meshed		30,345,530	
Sarakhs	313,540		
Turbat-i-Shaikh-Jam	505,810		
Turbat-i-Haidari	2,166,290		
Kashmar	1,384,480		
Gunabad	1,295,190		
Ferdows	941,120		
Tabass	839,860		
Quchan	2,236,700		
Lotfabad	311,480		
Darjaz	748,320		
Bujnurd	2,171,360		
Meshed	17,431,380		
Birjand		5,429,440	
Dermian	522,000		
Mighan	243,090		
Qaen	824,250		
Birjand	3,840,100		
Sabzavar		3,638,120	
Sabzavar	3,638,120		
Nishapur		2,354,560	
Nishapur	2,354,560		
OSTAN 10			32,348,350
Isfahan		21,744,810	
Ardistan	1,176,040		
Shahreza	1,859,230		
Najaf-abad	1,806,320		
Shahr Kurd	1,401,520		
Isfahan	15,501,700		
Yezd		10,603,540	
Ardekan	1,224,140		
Naiin	491,880		
Taft	613,840		
Yezd	8,273,680		
		Grand Total	Rls. 533,256,750

Source: The Ministry of Education.

Exhibit B-20

Page 1 of 3

GOODS AND SERVICES SUBJECT TO LOCAL TAXES WHICH ARE ALLOTTED TO EDUCATION

Locality	Taxable Items
Meshed	Sugar beets delivered to Ab-Kooh Sugar Plant Thread produced at Khosrovi Factory Cinema tickets
Nishapur	Bus travel (per passenger) Automobile travel (per passenger) "Free sugar" and cumin arriving in the town for consumption Wool, soft wool, camel hair, skins Refined cotton at the factories Tea, castor oil, soap, cotton seed oil Sheep, goats, lambs, cows entering the town Coal and plaster consumption Note: With the exception of the tax on the first item, only 15% of revenue collected is allotted to Education
Birjand	Electricity consumed (except that consumed by the Municipality) Note: Only 60% of this tax revenue is allotted to Education
Turbat-i-Shaikh Jam	All coal and ore from Cheshmeh Gol mine leaving the town Bus and automobile travel (per passenger) Cotton pod and raw cotton delivered to Jam Jeen Co. Note: Only 30% of revenue derived from last item is allotted to Education
Turbat-i-Haidari	Cotton leaving the factory
Bujnurd	Cotton sold by landlords
Shahrud	Electricity used by shopkeepers and craftsmen, homes, guest houses and hotels
Kazvin	Electric meters Ordinary flour of Kazvin Flour Factory Confectionery flour Cloth, knitting wool, blankets made locally Sheep, goats, calves, cows slaughtered in the town
Khorram-shahr	Dates (exported)
Bushire	Cloth and thread sold by Etemadieh Factory Electricity consumed Ice Fruit-bearing palm trees
Jahrum	Cotton imported into the town Fruit-bearing palm trees

Exhibit B-20

LOCALITY	TAXABLE ITEMS
ORUJEN (NEAR ISFAHAN)	Gum tragacanth (exported)
BAM	Fruit-bearing palm trees within 6 km of the town
	First and second class cloth-selling shops, grocery shops, trading firms
	Haberdashery, bakery, pottery, drug, confectionery, butcher and forage-seller stores
	Brokers
	Electric meters and radio receiving sets
KERMAN	Botanical oils, soap fat, edible fats
	Peas, walnuts, wild almonds, almonds, dried fruit, rice
	Lime, orange, grape and date juice
	Dates, green herbage, citrus fruit
	Lumber, wood, cement, copper, brass
	Cotton seed, dry and green lucern, barley grass, oil seeds
	Goat leather, jute, linen casing, sheep and kid skins, cow's and bull's hide
	Motor machinery, electrical equipment, automobiles, trucks, motor cycles, *bicycles, sewing machines*
	Fish, home conserved foods
	Cotton and woolen cloth, blankets, haberdashery goods
	Paper, cardboard, hardware
	Glass, crystal, mirrors
	Drugs
	Paints
	Cereals, fruits
	Gum tragacanth and gum assafoetida, henna
	Cocks, chickens, turkeys
	Matches
	Salt
	NOTE: Revenue is collected on all above goods imported into the town for consumption 7% of which is allotted to Education
SHADIGAN	Fruit-bearing palm trees
AHWAZ	Electricity, water, telephones, radios
	Transactions in official registration offices
ABADEH	Goat and ewe skins (exported)
	Carpets and rugs
	Dried whey, gum tragacanth, almond kernels
SHAHSAVAR	Ramsar's first and second class public baths
	First class hotel bills at Ramsar and Chalus
SANANDAJ	Contracts, auctions, adjudications
	Rental of farm lands
	Edible fats, gallnut, cowhide (exported)

Exhibit B-20
Page 3 of 3

Locality	Taxable Items
ABADAN	All second hand and scrap articles sold or given gratis by the Anglo-Iranian Oil Company in Abadan to persons NOTE: Ten per cent of present value is collected from present buyer, half of which is allotted to Education.
MAHALLAT	Cucumbers, garmak, melons, peaches, greengages, pears, quinces, autumn-apples, walnuts, potatoes, almonds Wood Sheep, goats, cows Passengers leaving the town Bus and automobile passengers to the hot springs Unrationed sugar
GHASRE-SHIRIN	Each Iranian leaving for or arriving from the frontier
KHORRAM-ABAD AND LORESTAN	Telephones, horse-cabs, bicycles, waybills of garages, radios Building construction licenses, new buildings Small transactions

Source: The Ministry of Education.

Exhibit B-21

SUGGESTED MINIMUM BIBLIOGRAPHY OF BASIC REFERENCE BOOKS DEALING WITH ANGLO-SAXON EDUCATION

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Stratemeyer, Florence B., Forkner, Hamden L., and McKim, Margaret G.—Developing a Curriculum for Modern Living, New York: Bureau of Publications, Teachers College, Columbia University, c1947.

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Vocational-Technical Training for Industrial Occupations (Report of the Consulting Committee on Vocational-Technical Training Appointed by the United States Commissioner of Education), Washington, D. C.: United States Printing Office, 1944.

1949 World Almanac and Book of Facts, New York: New York World-Telegram, 1949.

Exhibit B-22

RECOMMENDED ALLOCATION OF PLAN FUNDS FOR EDUCATION

In Thousands of Rials

	1328—Second Half			1329			Remaining 5½ Years			Total		
	Domestic	Foreign Exchange	Total	Domestic	Foreign Exchange	Total	Domestic	Foreign Exchange	Total	Domestic	Foreign Exchange	Total
Administration												
Foreign Staff	1,000	4,875	5,875	1,500	4,875	6,375	5,000	22,750	27,750	7,500	32,500	40,000
Iranian Staff	3,000	—	3,000	6,000	—	6,000	36,000	—	36,000	45,000	—	45,000
Operational Costs	2,000	—	2,000	3,500	—	3,500	22,500	—	22,500	28,000	—	28,000
Equipment Costs	700	1,950	2,650	1,200	1,950	3,150	225	975	1,200	2,125	4,875	7,000
Total	6,700	6,825	13,525	12,200	6,825	19,025	63,725	23,725	87,450	82,625	37,375	120,000
Educational Research												
Planning	80	—	80	70	—	70	350	—	350	500	—	500
Educational Services	950	325	1,275	1,625	325	1,950	7,150	1,625	8,775	9,725	2,275	12,000
Fundamental Educational Research	675	325	1,000	675	325	1,000	3,375	1,625	5,000	4,725	2,275	7,000
Information Office	1,030	650	1,680	1,070	650	1,720	5,150	1,950	7,100	7,250	3,250	10,500
Total	2,735	1,300	4,035	3,440	1,300	4,740	16,025	5,200	21,225	22,200	7,800	30,000
Decentralization and Educational Development												
Decentralization Program	400	—	400	400	—	400	200	—	200	1,000	—	1,000
Efficiency Unit	600	—	600	600	—	600	800	—	800	2,000	—	2,000
Total	1,000	—	1,000	1,000	—	1,000	1,000	—	1,000	3,000	—	3,000
Rural and Agricultural Education												
Village Development Program	2,000	—	2,000	6,000	—	6,000	62,000	—	62,000	70,000	—	70,000
Travelling Educational Missions	—	—	—	3,500	2,600	6,100	40,000	3,900	43,900	43,500	6,500	50,000
Rural Teacher Training Schools	20,700	13,000	33,700	40,000	13,000	53,000	120,700	2,600	123,300	181,400	28,600	210,000
Higher Agricultural Institutions	3,000	6,500	9,500	7,500	9,750	17,250	27,000	16,250	43,250	37,500	32,500	70,000
Total	25,700	19,500	45,200	57,000	25,350	82,350	249,700	22,750	272,450	332,400	67,600	400,000
Industrial and Vocational Education												
Stop-gap Emergency Program	9,375	1,950	11,325	13,000	1,300	14,300	9,375	—	9,375	31,750	3,250	35,000
Industrial Apprenticeship Training Program	7,750	13,000	20,750	12,000	13,000	25,000	67,750	6,500	74,250	87,500	32,500	120,000
Engineering Training Program	500	6,500	7,000	1,000	9,750	10,750	6,000	16,250	22,250	7,500	32,500	40,000
Clerical Program	350	480	830	500	480	980	2,850	340	3,190	3,700	1,300	5,000
Total	17,975	21,930	39,905	26,500	24,530	51,030	85,975	23,090	109,065	130,450	69,550	200,000
Tribal Education	—	—	—	5,000	—	5,000	45,000	—	45,000	50,000	—	50,000
Overseas Specialized Training												
Private Students	66	—	66	64	—	64	320	—	320	450	—	450
In-Service Industrial Trainees	64	—	64	66	—	66	320	—	320	450	—	450
Professional Personnel for Education	64	6,500	6,564	66	9,750	9,816	220	32,500	32,720	350	48,750	49,100
Total	194	6,500	6,694	196	9,750	9,946	860	32,500	33,360	1,250	48,750	50,000
Teacher Training												
In-Service Training Program	—	—	—	1,000	—	1,000	6,000	—	6,000	7,000	—	7,000
Summer Vacation Training Courses	—	—	—	2,000	—	2,000	18,000	—	18,000	20,000	—	20,000
Higher Teachers College	625	3,250	3,875	500	3,250	3,750	2,500	4,875	7,375	3,625	11,375	15,000
Libraries	250	650	900	250	975	1,225	1,250	1,625	2,875	1,750	3,250	5,000
Total	875	3,900	4,775	3,750	4,225	7,975	27,750	6,500	34,250	32,375	14,625	47,000
Educational Incentives												
Prizes	200	—	200	300	—	300	2,500	—	2,500	3,000	—	3,000
Scholarships	—	—	—	1,000	—	1,000	6,000	—	6,000	7,000	—	7,000
Matching Fund	—	—	—	2,000	—	2,000	18,000	—	18,000	20,000	—	20,000
Incentives to Teachers	—	—	—	5,000	—	5,000	65,000	—	65,000	70,000	—	70,000
Total	200	—	200	8,300	—	8,300	91,500	—	91,500	100,000	—	100,000
GRAND TOTAL	55,379	59,955	115,334	117,386	71,980	189,366	581,535	113,765	695,300	754,300	245,700	1,000,000

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REPORT ON

SEVEN YEAR DEVELOPMENT PLAN

FOR THE

PLAN ORGANIZATION

OF THE

IMPERIAL GOVERNMENT OF IRAN

VOLUME III

AGRICULTURE
WATER RESOURCES
METEOROLOGY
SURVEYING AND MAPPING
TOWN IMPROVEMENT AND HOUSING

OVERSEAS CONSULTANTS, INC.
NEW YORK
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VOLUME III

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AGRICULTURE

PART ONE—PROBLEMS AND BASIC SOLUTIONS

INTRODUCTION

Since approximately 80 per cent of the people in Iran are engaged in agricultural production, with others employed in the transportation and marketing of farm products, any plan which is designed to raise the level of living of the people of Iran must better the conditions of the peasants if it is to help more than a small part of the total population.

The condition of the Iranian peasant is most deplorable, as apparently it has been for many centuries. The typical peasant family lives in a one or two room earthen hut without windows and with only one door. The earthen floor is covered with a thin mat, if covered at all, on which blankets or mats are spread to make the beds for the entire family. The cooking is done over a small manure or brush fire in one corner of the room. Practically no fuel is available for heating the homes in the winter. Toilet facilities are found in only a few of the villages belonging to the more progressive landlords. Drinking water is often taken from the stream which irrigates the land about the village and which also serves as the place in which to wash the clothes, the dishes, and the meager cooking utensils.

Because the infant death rate is extremely high and disease takes a heavy toll of all age groups, the population has increased little in recent years and is now much smaller than it was in several periods of the more distant past.

In most rural areas facilities for even a primary education are woefully lacking.

Farming in Iran has changed little in several thousand years. The average peasant family farms about three hectares of land using little more than a wooden plow and a spade, with oxen, donkeys, and, in a few localities, small mules furnishing the power. Coupled with archaic cultural practices, these primitive methods and tools produce poor yields.

Bread, the chief item of diet for the peasant families, is supplemented by some dairy products and a little meat. Vegetables are used to some extent during the summer months, but are not widely available in the winter. The consumption of livestock products is much smaller than would be expected from the number of sheep and goats found in the villages, because these are the products which must be sold to get cash for the purchase of sugar, tea and clothing. Since cash operating expenses for farming are practically nil, the blacksmith, the carpenter and the barber are paid largely in produce.

Many factors contribute to the low level of living of Iranian peasants and to the small per capita wealth of the nation, but none is more important than the meager supply of agricultural resources. With the exception of the Caspian Area, Iran is a country deprived of many important natural blessings. In all other areas, rainfall is much below requirements for optimum crop production and about one-third of the country is desert. Additional difficulties arise from the fact that a fairly high percentage of the non-desert portion of the country is covered with mountains so rugged that cultivation would be impossible even if the rainfall were adequate. Much of the agricultural production comes from irrigated land. In this connection, it should be noted, however, that the area of good soil per capita in Iran is higher than in most Middle East countries, and much higher than in the Far East lands. While it is true that much of this soil needs irrigation, it is equally true that there are important water supplies which may be developed by the proper input of capital.

The agriculture of Iran is organized around villages which consist of a collection of earthen huts surrounded by high earthen walls. The villages and, for all practical purposes, the peasants are the property of the landlords, most of whom live in the larger cities or even abroad. Many of them seldom see their properties, an arrangement leading to bad farming practices.

Because transportation facilities are slow and expensive, marketing practices are primitive and agricultural prices fluctuate violently. Credit facilities are inadequate and interest rates are high.

Even on good soils to which water has been added by irrigation, crop yields are low due to improper cultural methods, ineffective control of crop enemies, large harvest losses, failure to use fertilizers, improper management of the soils, and inefficient use of water. The situation is further complicated by the scarcity of research work in the agricultural field. For instance, very little information is available concerning the effect of fertilizers on crop yields, or the profitableness of various livestock practices, and there are few trained men in the country who are fitted to do either research or extension work in agriculture.

The lack of mechanical equipment, and the resulting high input of labor per hectare make for low production per farm worker; the lack of power results in low crop yields as many operations are performed after the optimum time for doing the work.

Livestock management methods are both primitive and inefficient. Since very little feed for livestock is produced on cultivated land, animals die of starvation when pastures are short or winters severe, and livestock diseases destroy thousands more animals each year. Well-coordinated production and marketing programs are completely lacking.

Such natural resources as the forests and range plant cover of Iran have been badly damaged by charcoal burners and fuel gatherers. Overgrazing is universally common and, in the more arid regions, plant cover has been reduced far below the point for optimum soil and water conservation. Immense areas suffer from accelerated soil erosion that has been speeded up by the injury to the vegetation. Flood run-off has been increased at the expense of the underground water supply.

This section of the report deals with a more complete analysis of these problems and presents suggestions for an improvement program.

BASIC ECONOMIC PROBLEMS IN AGRICULTURE

OBJECTIVES OF THE PLAN

An analysis of the agricultural problems of a nation and a plan for improvement must be conditioned by the objectives assumed for such a study. The objectives of this study may be stated as follows: to raise the level of living of the peasant families of Iran and to increase the total agricultural production of the nation. The agricultural section of the Provisional Planning Board stated the aims of the plan for agriculture in words which may be summarized as follows:

To increase the production of foodstuffs for the population
To produce necessary raw materials for the domestic industries
To increase the export of agricultural products

Agricultural production results from the combined use of land, labor, capital (including water) and management. The total production for a country is determined by the supply of these factors and the efficiency with which they are used. Efficiency involves the combination and organization of the factors of production to secure the maximum net product for each farm unit. The program to increase agricultural production may, therefore, operate by increasing the effective supply of one or more of the factors of production or by increasing the product per unit of each factor used.

AGRICULTURAL RESOURCES

Land

Fortunately, there is an abundant supply of fertile land in Iran which is not farmed. Much of this needs water to make it productive, but there are large areas where dry farming will be profitable with modern machinery. The best available statistics indicate 4,600,000 hectares of land in crops and 12,000,000 hectares of crop land fallow. (Exhibit C-1) Another 33,000,000 hectares are described as usable if water and/or machines were available. This situation creates the most optimistic outlook for the improvement of Iranian agriculture. Considerable land is available on which to expand with mechanization, without replacing agricultural workers. This expansion should take place first since it can be done without disrupting other segments of the economy. The process should and will be a slow one. Later, if the development of transportation and industry creates a market for labor, peasants can be moved to urban jobs by further mechanization. All these developments should, however, be well co-ordinated.

Labor

Agricultural labor in the present Iranian economy is a factor which limits agricultural production. Estimates place the rural population at about 12,000,000, or 78 per cent of the total population. With the type of equipment available, these workers were able to produce only about two-thirds of an adequate diet for the people of the nation. In the United States, however, only 18 per cent of the population is engaged in farming. Using inefficient animal power and hand methods for most operations, the Iranian peasants are limited with respect to the area they can cultivate. At the present time the average area of crop per rural family is approximately three hectares. The net income from three hectares would not furnish a satisfactory level of living for a family, even if all of the income were available for the peasants. Farm labor could be easily made available for work on industrial projects, however, by the addition of capital in the form of machinery.

Capital

Capital is also a scarce factor in the agricultural economy of Iran. Wooden plows, spades, axes, sickles and forks represent a very small capital investment. If we assume 2,500,000 farm families and 1,500,000 oxen and donkeys, each family has six-tenths of a power unit. The investment in tools for Amr-abad village on the Veramin Plain was inventoried at Rls. 467 per worker. Shelter for the peasant families, their grain and livestock, is built of clay and requires much labor but practically no cash outlay. Capital is badly needed for the purchase of farm machinery and related equipment.

Many peasant families, particularly in years of low crop yields, are forced to borrow in order to live until the next harvest season. In some instances, credit is furnished by the landlord and this may be on a fair or an unfair basis depending upon the character of the landlord. On the other hand, the credit may be furnished by professional money lenders who habitually charge very high interest rates. The situation is made worse by the fact that payment is often made in grain at harvest time when prices are the lowest. Credit may be advanced by peddlers who bring sugar, cloth and shoes to the villages on the back of a donkey. They charge high prices for these products and in payment may take grain at harvest time at low prices. Many peasants find that at the end of the harvest period there is not enough wheat and barley left to feed the family through the next winter. This situation contributes to the low diet level, the high incidence of disease and the low vitality of the workers.

The situation as outlined above indicates clearly the need for agricultural credit to be furnished by the Government at low interest rates. The present Agricultural Bank is designed to furnish such credit, but to date has failed to function in an efficient manner.

Because loans from the bank have been made without adequate regulations or supervision, persons connected with agriculture have been able to borrow funds to be used for almost any purpose. Loans have been made to land owners, for example, to build houses in Tehran or to finance trips abroad. The volume of business of the bank has not been large, but salaries and operating expenses have been high. Therefore, the practice has been to increase interest rates and service fees to the point where loans have been made to farmers at rates which make them unprofitable for the borrower. In other words, the bank has been operated to make jobs for a group of workers, and a profit for the bank, with no consideration given to rendering service to the farmers. A limited number of landlords have had access to this service, but practically nothing has been made available for the peasants.

Water

For the most part, water in Iran is not a gift of nature but a capital item.

Large sums are spent for kanats, wells, irrigation channels and drainage ditches. Some of these structures are built by the peasants, but since the landlords usually hire specialists to build or repair kanats, this work represents a cash outlay.

One of the surest and quickest ways to increase the agricultural production of Iran is to make more water available for irrigation. Water may be added by drilling wells, by building canals, or by building both dams and canals. This phase of the problem is considered in detail in the water resources section of this report. (Vol. III)

The supply of water for irrigation can be increased by improving the condition of the plant cover on forests and ranges. This problem is discussed later in this section.

Crop production can also be increased by making more efficient use of the water now available to farms. This problem is covered in this section under Water Utilization.

Management

Management as a factor of production in Iranian agriculture is complicated and difficult to define. It is influenced by the feudal landlord-peasant system found in the village economy. Since the land, labor and capital may be furnished by several individuals, it follows that decisions affecting land use and agricultural practices may be made by several persons. The land and the water are usually furnished by the same person but not necessarily so. This situation often leads to a lack of co-ordination and therefore inefficient operation.

Although some landlords see their villages only once or twice a year and therefore contribute little to management, their decisions with respect to repairs on kanats and irrigation canals may be very important ones. The landlord may be represented by an agent who gives only part of his time to the management of the land which may involve primarily the collection of crops at harvest time. The landlord is usually represented in the village by a head man, called a mayor, who contacts the landlord directly or through an agent. The mayor determines the allocation of land to the village groups (boneh) and influences the area planted to the various crops. The boneh operates as a small co-operative and some decisions are made by joint action of the four to eight peasants involved.

The individual peasant furnishes labor and, in addition, may furnish either power or seed or both. His plans, coupled with his ability to execute them, determine time of planting, rate of seeding, method of irrigation, date of harvest and other farm practices. If the power is furnished by a party other than the peasant, another element of management is introduced.

Crops in Iran are supposed to be divided into five shares with one-fifth going to the person who furnishes each of the following: labor, power, seed, land and water. The peasant who can furnish labor, power and seed receives three times as much as the one who can furnish only labor. In practice, however, there are many variations of this system and the shares going to the various factors of production differ widely from one village to another and differ within villages for different kinds of crops. Summer crops are different from winter crops, fruit and nut crops are different from grain crops, and the share on dry land farming is different from that on irrigated land.

Much has been written about the evils of the landlord-peasant system in Iran and laws have been passed in an attempt to increase the proportion of the total income which goes to the peasant. Some progress may be made in this way, but not much. If the peasants received all the income from the limited area farmed, they would still have a low level of living. The only hope for increasing the well-being of peasants in Iran is to increase the area worked per family.

Agriculture is an industry of high capital requirements for land, buildings and water, and a young man cannot be expected to have enough capital to buy a farm large enough for his family. He should, however, have an opportunity to acquire ownership by accumulating savings from his tenant farming. Landlords in Iran, as in other countries of the world, render an economic service and should not be abolished. They provide the capital which enables many young men to farm.

There are good landlords and bad ones. The system of village economy in Iran seems to produce many bad practices, since some of the landlords are selfish and many of them see their villages only once or twice a year. Some villages are leased to operators who are interested only in getting the maximum return each year during the lease period. Government and church-owned villages are no better managed than those belonging to private individuals. In planning for the improvement of agriculture in Iran, the landlord as an institution should be retained, but practices should be promoted which will bring about better conditions for the peasants and an increased agricultural production for the nation.

Decisions concerning livestock practices are made by the peasants who are the flock owners, except that during certain seasons the flocks may be pooled and sent to distant pastures under the supervision of shepherds.

In an old and stable economy farm practices are likely to be well standardized with very little thought given to the discovery of improved practices. This situation seems to prevail in Iran. The introduction of improved practices through the Seven Year Plan will be rendered difficult by the fact that decisions concerning village economy are made by so many different people. Co-ordination will be achieved only as the result of special efforts.

ORGANIZATION OF RESOURCES

As previously indicated, agricultural production may be enlarged by increasing the supply of land, labor or capital, or by increasing the product from each factor of production available. These processes may occur simultaneously. It is the function of an agricultural improvement plan to increase the efficiency of management through a better combination and utilization of the agricultural resources, and through the use of improved farming practices. Definite recommendations designed to bring about improvements in Iranian agriculture in line with the objectives of the study, are made in the latter portions of this section.

Since land in Iran is a surplus product and labor and capital are limited in supply, it follows that an attempt should be made to increase the land in cultivation. This can be done by adding water, machines and working capital. The present output per farm worker is so low that the introduction of machinery would soon remove farm labor from the list of limiting factors.

It is a well-known principle that scarce and expensive factors of production are used conservatively in an efficient farm unit, whereas abundant and cheap items are applied more lavishly. In planning and operating a unit, it is customary to build the organization around the supply of the scarce or fixed elements, and then add the abundant ones to achieve the maximum net return for the combined input of all factors. The cheap factors are used to increase the efficiency of the expensive ones. In accordance with these principles, in Iran it is necessary to use the machinery and water to maximum capacity, whereas land may be added more freely to bring farming units into balance.

Machinery

Mechanization will be relatively simple on the lands now owned by the Government and which are not being farmed. This is particularly true for the areas such as the Gurgan Plain, Kazvin, Hamadan, Kermanshah and similar areas, where certain cereals and dry land grasses can be produced without irrigation. Though it will be somewhat more difficult in areas such as Khuzistan where water as well as machines must be added, the application of capital in these forms should be highly productive and profitable.

The introduction of machinery into the village economy will be more difficult. The problem is to get the machinery into the hands of the peasants rather than the landlords. Many landlords are now buying tractors to be used only for plowing. Their use for this purpose will increase crop yields, but since no provision is made for harvesting, which is the bottleneck in agricultural production, no peasants will be replaced and the area worked per family will not be increased. The peasant who has been furnishing oxen for power will take a smaller share of the crop if the landlord furnishes the tractor. Some method must be developed whereby the peasants furnish power and machinery and receive a fair share from an expanded area of crops. Demonstrations have been recommended which should show how this can be done.

Farm machinery is expensive, and foreign exchange will be needed since tractors and combines will not be produced in Iran in the foreseeable future. Tractors and combines should be added to the economy in units that are matched by relatively large land areas. Two- and three-plow tractors when used to produce cereals, cotton, flax and forage should be associated with 50 to 100 hectares of land and one peasant family. Where vegetables, fruits and nuts are produced under irrigation, the area will be smaller.

The introduction of machinery would immediately displace many persons from agriculture were it not for the fact that much additional land can be brought under cultivation. In the long run, however, some rural workers must be transferred to non-agricultural occupations to produce and merchandise the products which will be demanded when the income of rural farm families increases. The mechanization program is described later in this section.

Water

Since the supply of water for many parts of the country is very limited, it will tend to establish a maximum beyond which the agricultural production of a given area cannot be extended. There are, however, many sections of the country where the available water is not being put on the land and other areas where the water moving through irrigation channels is not used to best advantage. Plan funds set aside to increase the water supply of Iran should be used carefully and efficiently. The Agricultural Research and Extension Institute should determine the amounts of water needed in those areas where agricultural production can be increased most for each unit of capital spent for wells, dams, canals, or kanat improvement.

In this connection, the philosophy of the report to the Majless, relative to the Plan, may be quoted as follows: "In regard to the irrigation program, it must be pointed out that in most parts of Iran the irrigation development depends on the increase in the quantity of water. But forcibly, the increase of water will not be obtained by constructing dams on the rivers. Before undertaking the construction of great dams, for some years research and studies must be carried on, on the quantity of rivers' waters, in different seasons of the year, and on the climate of the regions which pour their waters to these rivers. As no such studies have been undertaken until the present moment, a first stage of the seven year period should be confined to such studies and the stage of dam construction should begin in the fourth or fifth year. But while waiting for the construction of great dams, some steps will be taken for supplying each region with water, according to its needs and possibilities. For instance, in one region a small dam will be constructed; in another place a canal will be built; in another locality, a deep well will be dug or the existing kanat will be repaired and improved.''

In line with this philosophy, we recommend, with a high priority, a complete survey of the water resources of Khuzistan and the Kur River valley in Fars. Wells and canals are recommended for several of the demonstration farms in various parts of the country. A report on the development of water resources is given in the following section in this volume.

Credit

Three types of credit are needed in agriculture: long term credit for buildings, dams, kanats and wells; intermediate credit for the establishment of tea plantations, orchards and farm woodlots; and short-term credit for the purchase of machinery, fertilizer and supplies for production and living.

Under current Iranian conditions, a Government bank which will supply needed capital at low rates of interest is recommended. If a sound banking policy is established, if the demonstration farms prove profitable, and if a feeling of security can be developed, private capital can be attracted to the Agricultural Bank. If the bank is properly organized and deposits guaranteed, funds could be increased by the sale of bonds to private investors. Many people would be satisfied with fairly low returns on their money if they felt that their capital were secure. The present exorbitant interest rates reflect a high payment for risk.

In other sections of this report we make specific recommendations that loans be made for the importation of machinery and related items, to establish co-operatives, and to organize a company to furnish supplies to peasants. Plans are also included to provide credit for the construction of on-the-farm fruit drying and processing units. In addition, we recommend that loans be made to establish orchards and woodlots.

All these operations deal with problems demanding intermediate or short term credit. These are the kinds of credit needed immediately by peasants; therefore they should have top priority. Landlords are in a much better position to get credit than are the peasants. Landlords will be aided, however, by Plan funds set aside to increase the supply of water.

Labor

One objective for improvement is to increase the amount of work that can be done by each peasant family. Mechanization is the answer to this problem. Machinery should be introduced first in those large areas where land is not now being used for crop production or in those villages where extra fallow land is available. If water can be added as well as machines, the product per worker can be increased by a more intensive use of the land now in cultivation and by increased crop yields.

Another method for increasing the productivity of labor is to provide work for a greater portion of the year. At present, the number of workers in a village is largely determined by the labor load at harvest time, when the cereals must be cut and threshed by hand. If these operations can be performed by machines, the same number of workers could operate more land or a smaller number of workers could operate the same area. A better choice of crops, with increased forage production, should also provide jobs for what are now slack periods of the year.

Management

The landlord-peasant problem, which is a very important part of the management problem, can best be solved by those projects and practices which are designed to increase the agricultural production of the nation. First of all, there must be more to divide; then research must be done to determine equitable divisions of farm products between landlords and tenants under a wide variety of conditions.

Some of the village customs should be discarded. Peasants should be free to move from one village to another, so that good landlords will get good peasants, and there will be an incentive for landlords to maintain attractive and productive villages. Peasants should have an opportunity to advance their economic position. A young man with no capital, for instance, could furnish his labor only, and get 20 per cent of the crop. When he has accumulated enough capital, he may furnish labor and seed and get 40 per cent; and eventually, by furnishing power also, he may be entitled to 60 per cent. If the production per worker is increased by mechanization, a peasant may be able to accumulate enough capital and experience to buy or procure from the Government a piece of land of his own, and operate as an independent producer. Additional discussion of this problem may be found in the legal section. (Vol. V)

Landlords, to function properly in the Iranian economy, must be interested in increasing the production from their villages and in the welfare of the peasants. They should study the problems of agricultural production, and be willing to adopt improved practices. Landlords, therefore, should live in their villages or supply intelligent management in the form of an agent or a mayor.

The importance of adult education can not be over-emphasized in this connection. The Agricultural Research and Extension Institute can play an important role at this point. Research is first necessary to determine profitable practices, which in turn should be carried to the farmers by the extension service through demonstrations and meetings using the aid of modern methods of visual education.

AMR-ABAD AS AN EXAMPLE

Accurate information concerning acreage of crops, crop yields, livestock members and farming practices was very hard to secure. The Government collects very little reliable information concerning agriculture, and farm records were non-existent. The situation was further complicated by the fact that village governors and peasants habitually gave erroneous answers to questions concerning agricultural production. This is a habit which has been developed as a defense against the Government policy of collecting taxes, and of taking a portion of the landlord's grain at less than market price.

Early in the period of investigation we decided to study one village in detail. Amrabad, a village on the Veramin Plain, with the volunteered cooperation and consent of its owners, was chosen as the one for the study. The Veramin Plain, a productive agricultural region about 45 kilometers east of Tehran, is watered by kanats and the Jajirud. The village is located about one kilometer south of the Veramin Agricultural Station and had therefore been observed by the station staff over a period of years. The soils were considered to be intermediate in quality with respect to the entire Veramin Plain.

In order to increase the accuracy of the data, enough time was allotted to the project to study all phases of village activity and to get information from several sources. Early in the study when it became apparent that accurate data could not be obtained on crop acreage and yields by questioning the village mayor or the peasants, arrangements were made to get an aerial photograph of the village on a 1:3333 scale. This map was taken to the village where the 1328 (1949) crops were identified, and the area in each crop and the total area in the village were calculated from the map. A set of average yields, assuming normal weather, was prepared by a committee of Iranians who were familiar with the soils and practices of the village.

An estimate of livestock numbers was obtained from several sources; the mayor of the village made an estimate, each peasant owning livestock was asked to give the number of livestock owned, and a third estimate was obtained from a representative of the Ministry of Agriculture who had worked with the peasants for several years. No two of the estimates were at all alike, but the one furnished by the Ministry was accepted as being the most reliable.

The village consisted of 50 earthen houses, 45 shelters for livestock, one bath house, one barber shop, one shrine, one mosque and one granary. There were 28 farmers in the village who were organized into seven boneh, with four oxen for each boneh. The buildings were appraised at Rls. 500,000 for the village.

The farming equipment was inventoried as follows:

Kind	Number	Value
Shovels	50	Rls. 2,875
Plows	14	7,000
Harrows	7	560
Hand Weeders	50	1,250
Sickles	14	700
Miscellaneous	—	700
Total		Rls. 13,085

Water

Forty liters of water per second are available from the kanat for most of the season. Available water from the river, ranging from 90 liters per second for Esfand and Farvardin (March and April) to a low of 10 liters per second from Tir through Bahman (July through February), flows to the village through a ditch 29 kilometers long (Exhibit C-2). The water for the village is divided by the water-man (dashtiban) with each boneh getting water for 24 hours each week. All the available water was used from Ordibehesht (May) through Azar (December) but not from Dey (January) through Farvardin (April).

Labor

Thirty men, 15 boys and 50 women work in the field at various times during the year. The women work in the field about four months of the year at weeding, picking cotton and harvesting grain. In addition to doing field work they weave rough rugs, make fuel cakes of manure, and care for their families. Of the total field labor about 45 per cent is done by the men, 22 per cent by the boys and 33 per cent by women. A maximum of about 1,800 days of labor are available per month during the summer season. There are 22 non-farmers in the village, six of whom work in the sugar factory and 16 for the Department of Agriculture.

Livestock

The following livestock numbers were reported as belonging to the peasants and the mayor of the village:

Kind	No.	Kind	No.
Oxen	43	Sheep and goats	1,500
Cows	8	Asses	18
Horses	4	Chickens	103
Camels	43		

These livestock use the straw from the wheat and barley, a small amount of grain, and glean from the cropped areas and fallow land. In addition they secure feed from the following sources outside the village:

1. Open lands around the village are grazed at various times during the year. These areas yield very little but weeds as the grasses have been destroyed by overgrazing and most of the bushes have been removed for fuel.
2. Ten square kilometers of winter grazing land is used from an area 50 kilometers south of Amr-abad.
3. About eight square kilometers of land, 80 kilometers north of the village, is used for summer grazing.
4. Four pastures 5 to 20 kilometers north of the village are used for sheep grazing on a part time basis. One of these, consisting of 200 hectares, is on irrigated land and furnishes excellent grazing on timothy and alfalfa. The other three pastures range in quality from fair to poor.

Most of the livestock production is consumed in the village, but there is an estimated average income of Rls. 75,000 a year from lambs, butter fat and poultry. An additional Rls. 2,150 was collected in 1327 (1948) for the use of camels. Reliable data relative to the amounts of grain fed to the livestock or sold could not be obtained. The following comparisons, which are designed to show what changes in production may be achieved by the introduction of machinery, improved cultural practices and the increase of water, are therefore limited to the estimated changes in crop production.

Value of 1328 Crops

With Present Methods

There will be a total of 108 hectares of crops grown in the village in 1328 (1949). Of this total, 72 hectares will be in wheat and barley, with 18 hectares each of cotton and melons (Exhibits C-3, C-4). Eighty-seven hectares will be fallow. It is estimated that these crops should be worth Rls. 868,680 if yields in 1328 (1949) are average and 1326-27 (1947-48) Tehran prices are assumed.

With Machinery Added

The experience of the Near East Foundation, which operates a village with mechanized equipment on the Veramin Plain, indicates that crop yields may be materially increased by the use of mechanical power coupled with improved cultural practices. This experience was found to be duplicated in other parts of the country. The following computations are based on these assumptions if machinery is added, but the water remains unchanged.

1. The acreage of both summer and winter crops can be increased by the use of machinery and better irrigation practice.
2. The yield of wheat and barley can be increased 50 per cent and the yield of summer crops 15 per cent by timeliness of planting, better seedbed preparation, better seeding practices, the use of improved varieties and the reduction of harvest losses.

The land use pattern and the estimated value per hectare and for the village are shown in Exhibit C-5. The value of crops is estimated to be Rls. 1,419,390 or more than a 60 per cent increase due to mechanization and improved practices. The increase would be Rls. 550,710 for the village.

To secure this increase a capital expenditure of about Rls. 211,000 would be necessary for a tractor, combine and related machinery. The annual charge for this machinery, including interest, depreciation and cash operating expenses, would be approximately Rls. 50,000. The labor input would be reduced from 144,000 hours with hand operations to 12,000 hours with mechanization. In other words, five men with a tractor and combine could produce the crops for the entire village.

The expansion of agriculture on Government lands not now farmed, and the use of fallow land in and near villages through the addition of machines and water, will create a demand for farm workers. An additional demand for workers will be created by various projects recommended by the Seven Year Plan such as the building, maintenance and operation of highways, railroads, schools, factories and communication facilities. It is logical that some of these workers may be drawn from villages such as Amr-abad where mechanization can be added. In case the peasants elect to remain in their village the increased production will provide for an improvement in net income of almost 60 per cent if divided equally among the original number of workers.

With Machinery and Water Added

In the two previous assumptions the area of crops was limited by the water supply. Information secured at the village indicated that the capacity of the kanat could be doubled by an expenditure of Rls. 65,000. The following calculations are therefore based on the assumption that the kanat water is doubled and that the village is farmed with machinery and with modern cultural practices.

The suggested land use includes 90 hectares of cereals, 20 hectares of melons, 40 hectares of cotton and 18 hectares of alfalfa for hay and pasture (Exhibits C-6, C-7).

Under these assumptions the area of fallow is materially reduced; therefore, some use of commercial fertilizer, in addition to the legumes, may be necessary to maintain yields. This system will provide for better feed for the livestock and, in turn, more manure for the land providing the manure is not burned.

The total value of crops, with the increased area in high profit crops, would be Rls. 1,656,480 or a 16 per cent increase over the value for mechanization without added water, and a 90 per cent increase over the present method of farming.

These calculations (Exhibits C-5, C-6, C-7) are included to demonstrate the approximate returns which may be expected from the addition of water, machinery and improved cultural practices to Iranian agriculture. The basic data are not sufficiently reliable to provide highly accurate estimates, but the principles of the problem are clear and research and demonstration projects have been recommended on the assumption that similar results can be secured in many parts of Iran.

DIFFICULTIES IN ADMINISTERING IMPROVEMENT PROGRAM

Inertia

Agricultural practices in Iran are as old as recorded history. Habits are firmly fixed and thoroughly entrenched in superstition and ignorance. Any changes which are made will be made slowly. The first step will be to gain the confidence of the rural people. The agricultural extension service is recommended as the agency best qualified to direct a program to overcome the faulty practices.

Lack of Trained Leaders

The agricultural college at Karaj has graduated several hundred men most of whom are now in the Ministry of Agriculture, where they have never had an opportunity to carry out a constructive program. The quality of training at Karaj apparently has fluctuated from time to time with changing administrations. It is reported that there were four different curriculi in effect in one particularly hectic semester. One staff member reported that he worked under five different deans in a two year period. Furthermore, the course of study is for only three years and is highly theoretical in character. Teaching has been from books with little effort made to connect the theory with farming practice. Graduates have not wanted to operate farms nor been encouraged to do so, but have desired the security and prestige of a position in the Ministry even if it paid only a third of a living salary. The low wage paid in Government positions has forced employees to work at one or more other jobs. As a result little effort goes into the official position and the major effort is devoted to earning a living at outside jobs. The Seven Year Plan cannot be put into operation with personnel who devote only a small portion of their time and energy to this important task.

There is available, however, a nucleus of Iranians who have had some training abroad. They have gone to many different countries and the quality and type of training has varied widely. They have learned a little of many systems, but not enough of them have learned one system to form a group that could build a satisfactory organization.

The following suggestions are designed to build up the needed personnel in a minimum period:

1. Bring in a large number of foreign specialists to work in the Research and Extension Institute, to teach in the agricultural college at Karaj, to operate demonstration farms, to contact the peasants in the villages, and to travel with the tribes.
2. Hold a four months short course for those Iranians of most experience who will be selected for positions in the Plan Organization.
3. Give a full year of training to a group of Karaj graduates who show promise of being useful later in the Plan Organization.
4. Send a few graduates of Karaj, preferably with some experience and much promise, abroad at an early date for one or two years of training.

Government Policies

An alarmingly high percentage of the persons interviewed were interested in the Seven Year Plan primarily from the point of view of personal profit. The officials in the provinces were interested in getting dams or wells for their areas or in getting jobs for themselves. Many landlords are planning to get control of land and tractors so that they can become more wealthy without regard to the condition of their peasants. Persons in official positions are most concerned with the enlargement of their departments and only incidentally in the agricultural development of Iran. Each group wishes to mold the policies of the Plan to fit its own organization or situation. The spirit of co-operation is entirely lacking. Apparently no one has convinced the agricultural leaders of the possibilities of a plan where everyone works for the common good with little thought of personal advancement. There is no conception of the idea of working for Iran's betterment, and no "esprit de corps".

The low level of wages in Government positions encourages bribery, which is reported to be common in all phases of Iranian business. As an example, a bribe may be necessary to get a permit to cut timber in the Caspian forest, a payment may be necessary to get the timber past each of several road guards stationed along the highway, and another to get an export license for the product. Such a series of bribes add much to the cost and uncertainty of doing business. Those practices greatly increase the risk involved in a business of this kind, since there can be no assurance that an export license will be granted even though a permit had been given to cut the timber for export.

Badly managed production and marketing programs for Government controlled products such as sugar and tobacco may seriously hamper agricultural improvement plans. This problem is more thoroughly discussed in the distribution section (Vol. V).

Lack of Security

No one feels safe in Iran. This applies to individuals as well as to business. The country is unsafe politically speaking, both from the external and internal point of view. In both World Wars I and II foreign powers took over the country and a feeling of stability and national independence has not yet been regained.

Internally, one is never sure of the Government—it may change at any time. Policies are seldom continued for a very long period. Ministries may change several times in one year. The attitude prevails among the people that the Government is their worst enemy. In recent years, there have been many difficulties between the Government and the people. The tribes rebel and are subdued by armed force. Armed guards are stationed constantly at thousands of points all over the country. Many incidents were reported which indicate that these poorly paid guards take toll from the people in the communities where they are stationed. Goods are taken by means of veiled threats or even more openly by force.

Private property is not safe in Iran. In Fars a producing orchard was visited from which the owner had never harvested a crop. The fruit when ripe was always picked by persons passing by. One year guards were hired, but this helped not at all, as the crop was taken by the guards, their families and their friends. There is little incentive for private capital to enter business in Iran, as is reflected in the prevailing interest rates, which range from 20 to 35 per cent. A venture must pay off quickly to be attractive.

The lack of security will hamper the introduction of machinery, which must be protected from theft by the owner. No machine can be left unguarded or it will be stripped of removable parts very quickly. There is a reason why even the new villages are built behind unattractive mud walls and gates are locked at night.

Under these conditions, it will be difficult to get landlords and peasants to adopt practices which will require some time to bring results. A people who have not enough to eat, and who expect some one to take a part of even that away from them, are not in a frame of mind to consider the possibilities of educating their children or providing medical care to those who need it. They are so close to the bare limit of physical existence that a tremendous effort will be required to build up in them enough hope and courage to call forth any extra effort.

The experience of the Near East Foundation in Iran, however, is encouraging. Workers who live with the people, and gain their confidence, can demonstrate improved practices that will be adopted by both peasants and landlords.

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Limited Transportation and Marketing Facilities

As indicated earlier, a large percentage of the agricultural production of Iran is consumed in the rural areas. There are, however, 12 cities having a population in excess of 55,000. The Tehran area has a population of approximately 1,750,000. The process of getting food from the surplus producing areas to these cities is both slow and expensive. Transportation from the villages to nearby cities is largely by donkey or camel, but trucks and railroads move produce from one city to another.

The average peasant has little to sell; a little wheat or barley in good crop years, some butter or mast, a little livestock, and, in some areas, some fruit or nuts. The landlord's share for the most part supplies the needs of the urban population. Special crops such as cotton, sugar beets, tea, tobacco and opium, are largely cash crops for both peasants and landlord. These products, with the exception of cotton, are purchased by the Government at fixed prices.

Agricultural products are sold without grading and for the most part without processing. Quality is often low and spoilage during transportation and retailing is high for perishable products. Products for export often receive unfavorable reception in foreign markets because they are low in quality or are not uniform in quality or packaging, and large shipments sometimes are rejected because of faulty preparation or delays in shipping.

A high percentage of the peasants is illiterate. They have only a limited knowledge of marketing practices, and no current information on the value of farm products. Under these conditions, very few co-operatives have developed and the peasants have no control over marketing processes. Improvements in agricultural marketing will be slow under these conditions, but work in this field should be started as soon as possible.

Improved transportation facilities from farm to city are needed and a good start should be made on this problem in the near future with Plan funds. (See the transportation section in Vol. IV.) Agricultural marketing is discussed more fully in the distribution section of this report (Vol. V), but we note here the following recommendations relative to the marketing of agricultural products.

We recommend that research be the first step. Plans for the Agricultural Research and Extension Institute described later provide for research and extension on marketing at the national level and for all the ostan stations. Instruction in marketing also should be a part of the expanded program at Karaj. The extension service with its field representatives in all important agricultural regions will bring to the attention of the research worker those local problems needing research study. The extension agents will also help to organize marketing agencies that are indicated by the research staff. Co-operatives, if organized, will require careful supervision for several years, until local leaders can be trained, a service which should be rendered through the extension personnel.

Only persons who work intimately with rural people, and who have their confidence, will have a chance to lead them in the adoption of improved marketing practices. In general, three classes of leaders can be of help on marketing problems: subject-matter specialists of the Institute working with the product involved, marketing specialists in agricultural economics, and men engaged in the processing, packing and marketing of the commercial product. Improvements in marketing practices will be made largely on a commodity basis, which means that most of the problems and projects will be localized. The initiative for these studies should be taken by the research director in charge of the ostan stations.

We recommend that marketing studies be started at any early date for the following:

The marketing of citrus fruits in the Caspian area, and of fruits and nuts at Kerman in the Fars province and in Azerbaijan.
The marketing of fruits in Khorassan.
The marketing of lambs and wool from the tribal areas.
The marketing of milk and vegetables at Tehran and other large cities.
Grain marketing problem at Gurgan, Kermanshah and Ahwaz.
The marketing of dates from the Khorram-shahr area.

CROP PRODUCTION

Total crop production in Iran is low for a number of reasons, among which the following may be listed:

Unwise choice of agronomic and horticultural crops
Improper methods of culture
Ineffective control of crop enemies
Unnecessary harvest losses
Failure to use fertilizers
Lack of scientific knowledge about soils

These problems are discussed separately in the succeeding pages.

UNWISE CHOICE OF CROPS

There is much evidence to indicate that the farmers in most sections of Iran are not growing some crops which they should grow, whereas certain other crops now being grown could more wisely be either discontinued or curtailed.

Potentially high-value per hectare crops such as cotton, sugar beets, tobacco, tea, and flax for seed (linseed), are good examples of crops not being grown as widely in adapted areas as they should be. Many vegetable and fruit crops, especially important from the standpoint of the health of the people as well as on the basis of returns to growers, are being grown in small quantities or not at all in many places where they are well adapted. Many valuable forage crops such as alfalfa, miscellaneous clovers and grasses, and grain and forage sorghums—all urgently needed to increase the production of milk and meat and to reduce livestock losses—are grown little or not at all in Iran. The opium poppy can be replaced in most areas by some of these crops. On the other hand, in many places there is too great a proportion of the area devoted to wheat and barley from the viewpoint of best land use.

No doubt there are many factors which are responsible for the unwise choice of crops currently being made by Iranian farmers. On the basis of field observations we list some of the factors in the following paragraphs.

There is a lack of knowledge of the possibilities of growing certain crops. For example, in areas of adaptation, more farmers might grow cotton, or flaxseed, or alfalfa, or olives, citrus, or vegetables if they were familiar with those crops.

There is a serious lack of the equipment (such as farm machinery and tractors) needed to grow certain crops more extensively. As an example of this situation we may cite the difference between the number of man-hours required to grow typical field crops in Iran as compared with areas in the United States where those crops are grown under similar irrigated conditions. A careful survey has shown that in Iran eight times as many hours of labor are required to grow one hectare of cotton and twelve times as many for wheat as in the United States. That difference is reflected in the total area that can be cropped.

Furthermore, while some crops cannot be grown more extensively without certain tillage, planting, cultivating and harvesting machines, others cannot be grown successfully at all without suitable mechanical equipment. Examples of this latter situation are hay crops such as alfalfa, which requires mowing, raking and baling machinery; fruit and nut crops which demand high-pressure spraying machines for disease and insect control; and various vegetables and sugar beets which require specially designed planters, cultivators and dusters.

No satisfactory program of plant improvement through breeding and selection exists. Practically every agronomic and horticultural crop now grown in Iran can be improved in quality and yielding ability through the application of known plant breeding techniques. As examples, the following may be listed: apples, pears, peaches, citrus of all kinds, wheat for specific uses, barley, oats, rice, cotton and jute for spinning, and tobacco.

The lack of a systematic plan to provide stocks or supplies of good quality planting seed is related closely to the need for breeding and selection. The important fact is that in the practice of farming there must be some sort of organization to increase and protect stocks of seed of crop varieties which plant breeders have developed. Examples of agronomic crops for which such an organization is needed urgently are cotton, flax, rice, sugar beets, tobacco, and wheat. This subject is discussed and basic plans for a seed stocks' program are given on pages 103 to 106 of this report.

The landlord-tenant relations may be a hindrance to a proper choice of crops to be grown. This may be a very important factor. For example, while it is quite simple to work out a division of crop produced in the case of wheat, barley, or rice, it may be very hard to divide the product of a forage crop like alfalfa which is fed to livestock. Likewise, in some areas, there has been no custom of dividing "summer crops" between landlord and tenant, a fact which has caused some unwise choices of crops grown.

A lack of proper encouragement in the form of prices paid for the crop has been a hindrance in some instances to a wise choice of crops. As a rule no other single factor is more important than the relative amounts of money received in influencing a farmer to grow one crop rather than another. In Iran a striking example might be drawn from the culture of the opium poppy. Despite a Government decree against its cultivation, both farmers and landlords will permit or even encourage poppy production as long as the income per hectare from the opium is several times greater than from other adapted crops which might be grown. Furthermore, if crops such as tobacco, wheat, and cotton are to be sold under a Government-controlled price basis, an out-of-balance price may have great influence on the extent to which a given crop will be grown.

The absence of suitable processing and marketing facilities is restricting the area devoted to some crops. For example, citrus fruits might be grown more extensively in some areas if there were adequate grading and packing plants and factories for "juicing" and canning the surplus fruit. A much larger tonnage of raisins and other dried fruits and nuts would be saved and marketed in an attractive condition if suitable processing, grading and packing facilities were provided. Many more fresh fruits and vegetables, so necessary to better health, no doubt would be grown if there were satisfactory facilities for carrying the products to the consuming centers.

General Recommendations

There is no doubt but that changes with respect to the foregoing factors can be effected which will result in a better choice of the kinds and amounts of the agronomic and horticultural crops which will be grown.

The most important single step that can be taken will be to establish a sound program of agricultural research as presented later in this section. A good research program involves careful testing of different crops, varieties, and methods, under controlled conditions. For example, the men in charge of the research work in field crops must develop programs to test different kinds of crops at the various ostan stations and substations where those crops might be adapted. Flax, soybeans, sugar beets, sugar cane, and tobacco are examples of crops that should be planted at several locations. It is important to develop the widespread production of a legume crop which will provide a cheap source of protein for the low income families of Iran. This type of food is needed to balance the rice and wheat used so extensively. The objective of such a testing program should be not only to learn the actual adaptation of such crops, but also to determine their suitability in comparison with others which might be grown under the same conditions.

A similar program with horticultural crops would be developed by the research personnel trained in that field of plant science. For example, those workers would explore all the possibilities of crops like tea, citrus and olives through a correlated program carried on at the ostan stations and substations in the areas where such crops might be adapted.

When successful possibilities of culture for certain areas have been proved by such research trials, educational demonstrations would be carried out by the shahristan extension agents to implement the production of those crops.

The landlord-tenant problems, like those having to do with price influences and marketing facilities, will have to be given careful study by men trained in agricultural economics before wise, sound solutions can be offered. Too many factors are involved to attempt to offer any immediate answers. Needless to say, when they are solved, it will help greatly to increase production through a better choice of crops.

If the program just outlined be started and carried on diligently and consistently there should be very soon a much better adjustment in the number of hectares used for some of the newer crops and their total production could be increased on a sound basis.

IMPROPER METHODS OF CULTURE

One of the easiest and quickest ways to increase crop production in Iran is to improve the methods of culture. In this discussion "crop culture" is used to include all the steps taken in growing a crop to maturity.

Iranian farmers generally have totally ineffective equipment for growing crops by modern methods. Except for the steel-tipped, wooden plow drawn by one of two oxen, donkeys, or small mules, and perhaps a small wooden drag or clod-crusher, most farmers have only hand tools for land preparation and cultivation. Almost nothing but the human hand is available for seeding and planting operations.

Unsatisfactory tillage practices follow naturally the lack of proper equipment. Plowing, as the first tillage operation in most crop culture, is being done poorly in many cases. The land is not being turned deeply enough nor thoroughly enough to kill the weed growth and to make a good seedbed possible. Disc harrows and spike-tooth harrows are needed for final seedbed preparations. Under some soil conditions land rollers of one type or another should be used but are not available now.

The excessive costs per hectare of hand operations are presented and discussed in the farm machinery section (Page 59). It is quite clear from that discussion that Iranian farmers cannot hope to increase the production of crops to any great extent by increasing the area cultivated by animal power. Modern tractor-operated tillage equipment will have to be provided before much more land can be brought under cultivation. Furthermore, the types of equipment needed for leveling land and fitting it for proper irrigation must be made available.

Low quality seed causes poor stands and inferior quality of product. Weeds of many kinds were seen to be prevalent in wheat and barley fields in most areas visited. Some of the weeds are due to unsatisfactory tillage (seedbed) operations. Much of the trouble is due to a lack of seed cleaning equipment with which many troublesome weeds could be removed from planting seed. Fields were observed frequently in which barley and wheat were mixed together; others in which different types and varieties were growing together. Such conditions usually result in uneven ripening, losses from shattering, and a mixed product of inferior quality for human use. With crops like cotton, sugar beets and tobacco, mixed seed stocks lower materially the quality of the product.

Hand scattering of grain, followed by covering with a plow, wastes seed and seldom results in an even stand or a uniform full crop. Several different crops (for example, cotton and sugar beets) which should be row-planted to permit cultivation are being planted broadcast in some locations. That practice wastes seed, gives uneven plant stands, requires hand cultivation to control weeds, and usually results in lower yields and poorer quality of product. Other crops were being planted on a flat seedbed (onions, for example) when raised-bed plantings would have been better both from the standpoint of subsequent cultivation and irrigation practices. Many small seeded crops such as sesame and various vegetables are most difficult to plant satisfactorily by hand.

Unsound irrigation practices are followed. For some crops such as cotton and sugar beets, a heavy pre-planting irrigation promotes early, vigorous plant growth and in the long run, saves water. Flat irrigation often wastes water and results in lower yields of some crops for which raised-bed planting has been proved superior in Iran and elsewhere. The border check ridges being used commonly are quite inadequate for crops like alfafa which need heavy irrigations to keep the subsoil moist and to prevent "salt" accumulations.

General Recommendations

There are several steps which must be taken if crop production is to be increased by improving the methods of culture. In the first place, modern, efficient tillage implements must be made available to Iranian farmers. Many tillage implements would be bought and used if they were available. Demonstrations are being planned to acquaint farmers as fast as possible with mechanized farming operations. That phase of the program should be developed rapidly.

In the meantime, research work should be started as soon as possible at the centers being planned to learn the best methods of machine culture under Iranian conditions. For example, with some soils a moldboard type plow may be found best, while with other soils a disc plow may be better. Tests with different kinds of drills, row-crop planters and cultivators also will need to be run as soon as equipment is available.

It will be necessary to run field tests for various crops under different soil conditions to determine whether they should be grown with flat seedbed culture or on raised beds, as well as what type or height of bed is best for different crops and conditions of soil and water.

The problem of low quality planting seed can be solved in part by the introduction and use of adequate equipment for cleaning seed mechanically. The use of such equipment as well as of the tillage machinery discussed in the preceding paragraphs will have to be taught to Iranian farmers by extension methods.

To improve the genetic purity of crop seeds will require the services of plant breeders trained to work with all kinds of agronomic and horticultural crops. Then, when they have developed improved varieties of crops, there must be a pure seed program to increase and protect the improved stock.

Irrigation practices which are sound, both from the standpoint of efficient water use and crop yields, can be determined only by field experiments designed and executed carefully. Such work, of course, must be done by a co-ordinated program with specialists in soils, crops, and irrigation working in co-operation. Such a program will secure the greatest amount of information from any test conducted.

INEFFECTIVE CONTROL OF CROP ENEMIES

During visits to the various agricultural areas of Iran considerable evidence was gathered to show that crop enemies (diseases, insects and weeds particularly) are not being controlled effectively. A basic fact to remember is that it costs fully as much (frequently more) in the way of seed, labor and water to grow to maturity a crop infested with weeds and attacked by diseases and insects as to produce one free from such enemies.

Not many Iranian crops were observed during the active growing season because almost every area was visited during the early spring. Reports indicate, however, that seed treatment, for the control of certain diseases of both agronomic and horticultural crops, is seldom practiced. It is also quite uncommon to dust or spray any field, fruit or vegetable crops to control diseases and/or insects. Furthermore, there seem to be neither a systematic research program to learn more about Iran's crop enemies nor a plant breeding program to develop new crop varieties to resist or escape the attack of the various enemies.

Continuous culture of any one kind of crop such as wheat or barley, for example, tends to favor the enemies of that crop. This is true even though a year or two of fallow comes after each crop. Some diseases and some insects spread from one field to another and incomplete tillage of fallow land, which is common, is of little help in weed control.

General Recommendations

A considerable fund of technical information is essential before much progress can be made in the control of crop enemies. Diseases and insects not only must be recognized but their life histories, and means of spreading must be known before control work can be done effectively. Likewise with weed enemies, studies must be made to determine the means by which they are propagated and spread, and when they are most easily killed by cutting, by chemicals, or otherwise.

This type of research work must be carried out by specially trained personnel such as plant pathologists and entomologists who will be located at the various experiment stations of the Agricultural Research and Extension Institute. Those workers must start with the information now available as a result of studies already made by the Ministry of Agriculture or by other agencies in Iran. From that beginning sound research programs must be developed to determine which of the major crop enemies can be controlled and by what practical methods. After the knowledge is available, farmers must be informed by extension service workers concerning effective control methods. Farmers may also need financial assistance to carry out the actual control work. With some kinds of crop enemies it is quite ineffective for individual farmers to attempt control while adjoining farmers do nothing. Some diseases, some insects and some weeds, for example, may spread or travel rapidly from one place to another. In such cases only large-scale, complete coverage control campaigns can be effective. For such over-all campaigns an agency like the Ministry of Agriculture should be called upon since nation-wide and perhaps international arrangements and organizations may be needed. (This subject is discussed more fully in the latter part of this section.) The extension workers in the various ostans would be called upon to assist with such programs at the local level.

UNNECESSARY HARVEST LOSSES

There could be a considerable increase in total crop products in Iran if the losses occurring before and during the harvest (and threshing) season could be prevented. The following are examples of such losses:

1. Wheat and barley are wasted because of delayed harvesting due to labor shortages. Plant lodging and shattering, bird and rodent damage result from those causes. Threshing floor losses occur also.
2. Cotton suffers loss and/or decrease in value by delayed picking. The seed cotton is blown out of the burs by the wind. If an attempt is made to save such cotton, its value is decreased by dirt and trash picked up with it.
3. Sugar beets are being wasted by delayed harvest and by inadequate transport for hauling the beets to the factories. Delay in harvesting results in freezing, injury or even complete failure to gather the crop; both spoilage and damage result from slow and inadequate hauling facilities.
4. Losses in quantity and quality of tobacco occur because of improper storage of the leaf after it is cured.
5. Tea losses occur because of slow transport of the leaves and too few well-located processing plants.
6. Perishable fruits, such as citrus, dates and deciduous types, are lost because of inadequate processing and packing plants and poor facilities for transport to markets. Many perishable vegetables are lost or not widely used because of the same inadequacies.
7. Much loss occurs with miscellaneous crops due to poor storage facilities—to some, like fruits and vegetables, even after they reach the retail markets.

General Recommendations

Adequate mechanical harvesting equipment together with a knowledge about its use will go far toward reducing harvest losses to a minimum. This will involve making the equipment available, and, through extension demonstrations, showing farmers how to use the equipment or helping them to arrange for custom harvesting.

For a crop like cotton, which may be hand picked for some years in Iran, to have a sufficient supply of harvest labor is the best answer to crop losses. It should be possible to work out through the local agricultural extension personnel some plan by means of which the heavy seasonal demands for harvest can be satisfied. In the United States, for example, much of the harvesting of cotton, perishable fruits and vegetables is done with transient labor—people who follow the harvest of certain crops from one area to another and who earn their living by gathering the crops. Some such plan may have to be worked out in areas of heavy production in Iran if local labor is not sufficient to harvest the crops promptly so as to prevent losses. Transportation of harvest workers from one area to another by Government-owned trucks may be desirable. Temporary housing facilities should be provided at or near the villages where the laborers are needed.

The losses in tobacco and tea are preventable, in large part. There should be a careful study made of both of those crops to determine the economic needs of the producing areas. If improved storage facilities on farms or at semi-centralized village points are found necessary and desirable for tobacco, it should be decided who shall build them and the construction should be done without undue delay to prevent further losses. Likewise with tea, if more processing plants are found to be necessary, plans should be made for their construction. On the other hand, it might be found cheaper to improve the transportation of the tea by expanding the use of trucks to replace the present donkey transport system. The marketing specialists in agricultural economics at the experiment stations in the tobacco and tea growing areas should find solutions to the foregoing problems.

Sugar beet losses during and after harvest can be decreased by temporary on-the-farm storage as suggested in the industry and mining section (Vol. IV), and by replacing the slow, wasteful donkey and camel transport with trucks.

Fruit and vegetable losses also can be reduced by improving transportation. This problem warrants full study of ways and means of increasing the use of motorized transportation in rural producing areas. The construction of the fruit processing and packing plants being planned for several areas should help greatly to reduce the current losses.

Credit in the form of harvest loans should be provided under the Seven Year Plan. Such a procedure would help growers to hire additional laborers sufficient to harvest their crops quickly, hence reducing the losses of various crop products.

FAILURE TO USE FERTILIZERS

There is little doubt that the yields per hectare of some crops could be increased through a well-founded program of soil fertilization. Under present agricultural practices almost nothing is being done to maintain or add to the productive capacity of Iranian soils. Much of the animal manure is used for fuel. Of course, manure from poorly fed animals has limited value as fertilizer. The above-ground plant residues such as straw of all kinds, bean, and pea vines are thoroughly removed from the fields for feed or fuel, and the growing of crops as green manure specifically for soil improvement is uncommon.

With grain crops predominant in the farming system it is only natural that the total supply of chemical elements such as certainly phosphorus and potassium, and probably nitrogen, are being decreased steadily. Unfortunately no carefully planned research work has been carried on over a long enough period to determine the needs of any of the major agronomic or horticultural crops for chemical fertilizers.

There has been considerable attention given to the question of erecting factories in Iran for the manufacture of chemical fertilizers. After careful consideration of the problem it is being recommended that only a plant for the production of nitrogen fertilizer be erected under the Seven Year Plan at this time. Much further study is recommended to secure data relative to:

Actual crop needs for fertilizer
Cropping practices which may be limiting yields
What raw materials are needed and/or available from which to manufacture fertilizers
The power and equipment needs for fertilizer manufacture
The economics of marketing fertilizers

General Recommendations

This soil-productivity problem has never been solved satisfactorily in any country without the benefit of a sound soil research program. Certainly no attempt should be made to solve the problem by starting at the top—that is, by building up an Iranian chemical fertilizer industry. In time it may be determined that a large fertilizer plant capacity is needed.

Fertilizer Research and Extension

The research program being planned for Iran will have personnel trained in agronomic and horticultural crop culture as well as others trained in soil science. Those men should be called together (foreign advisers and Iranians) very soon to study the fertilizer problem and map out a program for the major crops of the leading agricultural areas. Carefully designed experiments should be planned and should be run for at least a three year period so that seasonal differences can be eliminated at least partially. Chemical fertilizers for at least the first few years of such a program will be purchased from foreign sources. It would be advisable to run some of the tests on grower farms as well as on the experiment station farms so as to check the various fertilizers under several different soil conditions.

As soon as reliable results are secured (some good indications may result from even the first year of testing) they should be given to the agricultural extension workers. These workers should use the results to get fertilizer demonstrations started with growers of the various crops.

By the end of the second year, if there are fairly positive indications of chemical fertilizer needs, plans can be developed rapidly for the construction of factories for their manufacture.

Soil Organic Matter Studies

It is highly important too that studies be started to determine the role of organic matter in Iranian agriculture. It is a recognized fact that for irrigated agriculture under arid and semi-arid conditions, problems of soil organic matter maintenance and value are quite different from those under temperate climate with humid or sub-humid conditions. The relationships between soil organic matter, water percolation and penetration, and "salt" or alkali accumulation need research study.

The foregoing problems and others related to soil productivity are associated closely with the needs for and uses of chemical fertilizers. No specific recommendations can be made other than that the soils and crops research men at the various proposed experimental stations should investigate all of the related problems as rapidly as possible.

LACK OF SCIENTIFIC KNOWLEDGE

Crop yields in Iran are low in part because of the lack of information about the soils. The science of geology is involved as well as those phases of science known as soil physics, soil chemistry, and soil microbiology. Tillage, fertilization and irrigation practices are all related to or influenced by basic facts which can be revealed only by a scientific study of those subjects. Such studies have not been made in Iran, or, if made, they have not been closely related to agricultural practices.

Some sort of program should be started which would accumulate a fund of knowledge about the soil and water resources of the country. A recommendation for a land and water resources service for Iran will be found on page 117 of this report. If that service can be organized soon it will help to provide the information which the soils research men and crops specialists will need for developing effective soil management programs in the ostans.

INCREASING SELECTED CROPS

Much interest has been shown on the part of the agricultural section of the Provisional Planning Board in taking steps to increase the production in Iran of certain specified crops. A separate and distinct program was recommended for promoting the growth of such crops as flaxseed, silk, tea, tobacco, olives, citrus, and sugar cane. In some cases it was suggested that foreign specialists experienced in the production of a given crop be brought to Iran to work on only that one crop. Another suggestion was that funds from the Seven Year Plan be used to promote the new crops through loans and special purchase programs.

There are some desirable features of the recommendations of the Board. We believe, however, that a sounder approach to the problem of developing production of any crop lies in an overall research and extension program as has been proposed for the various experiment stations. Under that program, for example, there will be at least one research man for plant science at each station working under the supervision of the plant science personnel at the central Research and Extension Institute. Within the plant science personnel at least one foreign specialist should be employed to give direct attention to each one of the crops. For example, there should be one for silk culture, one for tea, one for olives, another for tobacco, and so on. Other "new" crops which may have possibilities in Iran should be studied. For example, since the plant known as pyrethrum can be grown, its commercial production as a source of a most useful insecticide should be investigated. That plant produces a low-weight, high-value per hectare crop which might prove to be a useful substitute for the opium poppy.

Each of the special workers should be located at an experiment station in an area where the particular crop is grown or presumed to be adapted. Although each such worker would be directly responsible for the research on the one crop, he would be available also for advice, consultation and perhaps some research on other crops problems.

At the main research center plants will be developed to determine the possibilities of producing each kind of crop.

With a crop like flaxseed, for example, a preliminary testing program would be set up to determine just how widely adapted flax is in Iran. Seed from various sources would be planted at different times at the various stations using several possible methods of culture. At the same time other crops would be grown to compare them with flax on the basis of crop returns.

If and when the flax crop showed real possibilities it would be introduced to growers through demonstration methods carried out by the extension agents. Should it appear that special incentives, such as marketing facilities or loans, are necessary to stimulate the production of flax, Plan funds could be used to provide them. Attention should be given particularly to the promotion of crops which can replace the opium poppy. Special educational campaigns will be desirable to speed the introduction of new crops, and in some areas, where satisfactory substitutes are not available, subsidies may be used during the period of adjustment.

At the same time the extension program was being developed, the research work would be refined and continued. Plant breeders would start developing improved varieties of flax, soils men would set up fertilizer tests, and trials would be started to learn how best to irrigate the crop.

If such a program were followed it would be determined soon just what place the flax crop should occupy in Iranian agriculture. Exploitation of the crop would be on a sound basis and not influenced by artificial conditions.

In a like manner, other crops like tea, silk, cotton, citrus, sugar cane and tobacco would be going through similar testing programs at the various stations. Within three or four years time all but the slow-growing tree crops should have been subjected to sufficiently thorough testing programs to know which crops should be promoted in the various parts of the country.

To provide for a more or less systematic rotation of crops for maintaining soil productivity, and to equalize the seasonal demands for water, labor and equipment, it will be found best, with certain limitations, to promote mainly those crops which Iran can grow advantageously, especially if the crop which grows relatively better than another also enjoys an economic advantage from the standpoint of local or world demand. In this connection mention should be made of the desirability of studies to determine the economic possibilities of sugar beet production in Iran. With current cultural practices, sugar from Iranian-grown beets costs much more than does imported sugar.

Such a comprehensive program should make the best possible use of research personnel, experimental facilities and equipment. It would avoid the very expensive and complex proposal made by the agricultural section of the Provisional Planning Board to transport several families from a foreign country to promote production of crops like silk or tobacco, for example. Also, under the plan recommended herewith, there would be less chance for unwise competition for funds and over-emphasis on what might be a minor crop as a result of better "salesmanship" of the workers concerned with that crop.

Early emphasis should be given, both as to expenditures of Plan funds and effort, to those crops which will increase the production of food and fiber most rapidly. It would seem unwise, for example, to give very great emphasis in the early years of the Plan to expanding tree crops such as citrus, dates, nuts and olives which cannot contribute soon to increasing Iran's food or fiber supply.

WATER UTILIZATION

The development of water resources for use in irrigated agriculture will be covered in the water resources section of this volume. Only the problems of use of water in crop production are considered in this section.

Much of Iran's supply of irrigation water is wasted after it reaches the farms. Some of the causes of waste are listed below and discussed in succeeding paragraphs which include suggestions for preventing water losses:

Poorly leveled land
Inadequate control of water
Improper methods of culture
Unwise irrigation schedules
Poorly balanced cropping systems
Methods of applying water not adapted to soil type
Tillage equipment inadequate
Winter flood water not well used

POORLY LEVELLED LAND

With irrigation water as limited as it is in Iran everything possible should be done to make efficient use of the water. At the present, much of the land is not properly levelled so as to spread the water uniformly. One of the main reasons for poor levelling is the lack of proper equipment for measuring the slope or fall of land and for moving soil.

Another cause of improper land levelling is a failure to understand the relationship between adequate, uniform water penetration and crop yields. When parts of fields are higher than adjoining areas there is no possibility of wetting the soil to a uniform depth. Uniform crop growth cannot be secured under such conditions. An adequate type of surveyor's level should be available for land levelling use.

There seems to be a lack of realization of the important relationships between the soil type, the slope of the land, the head of water used, and the rooting habits of the various crops being grown. For example, down-slope irrigating may work well on rather sandy soil which takes water readily, whereas on a heavy silt or clay soil, flooding down the slope may result in poor penetration and wasted water. Deep-rooted crops like cotton and alfalfa cannot be grown satisfactorily with frequent light irrigations.

INADEQUATE CONTROL

Inadequate means of controlling the irrigation water results in loss and waste. Field ditches are not well constructed nor are they fitted with gates, turnout boxes or other structures which make it easier to change the water from one land or set of furrows to another. Both time and labor, and frequently water, are wasted when such water-control structures are lacking.

Inadequate border checks or ridges are used for some crops which allow the water to break across from one land to another resulting in uneven watering, or make it impossible to apply enough water to a land to secure sufficient penetration. Inadequate penetration wastes water.

There seems to be little relationship between the methods in use for controlling the water and the soil type, the head of water available, and the slope of the land. For example, flooding between border ridges may be quite satisfactory for fairly level land with heavy soil and a good head of water, whereas, for heavy soil on a slope, flat flooding is likely to waste water and not result in getting the water to penetrate to a desirable depth.

IMPROPER METHODS

Irrigation water is being wasted because of improper methods of culture of some crops. For example, sugar beets are being grown by broadcast seeding in flat basins. The yields commonly are lower than they should be which means the water is not being used to best advantage. Likewise, cotton is not grown as it should be under some soil and water situations. Broadcast planting on a high bed usually will not result in a maximum yield of lint. Onions, too, are incorrectly cultured by being sown broadcast in flat "basins", which necessitates flooding over, resulting in baking and cracking of the soil.

It seems likely that the common practice of mixed plantings of dates and various kinds of citrus fruit cannot result in the best use of the water. As with herbaceous crop plants, different kinds of trees differ in the amount of water required and in the time it should be applied to produce the maximum yield.

Excessively deep water furrows around small lands, faulty from the standpoint of water efficiency, were being used in the Shahbankareh area on wheat and barley, neither of which demands excessive amounts of water.

UNWISE IRRIGATION SCHEDULES

Irrigation water was being wasted by faulty irrigation schedules. Timeliness of applying the water is known to be fully as important as the amount used. Part of the difficulty no doubt is due to a lack of accurate information regarding actual needs of the different crops. Also, it is probable that in some cases water is not available in sufficient quantity to allow all growers to irrigate according to a correct schedule even though the right time interval might be known.

UNBALANCED CROPPING SYSTEMS

Poorly balanced cropping systems are wasting water. If the water supply is fairly constant throughout the year, as it is when water is supplied from stream pumping or kanats, it is highly important to have such a balance between winter and summer crops as to make full use of that water. In one area in the United States, for example, it has been found that a much larger total area of crop can be produced under pump irrigation if diversified cropping is practiced as compared with a one-crop system.

Also, with a great difference in water requirement of various crops, it is highly important, in so far as possible, to choose those crops which will make the best use of the available water.

IMPORTANCE OF SOIL TYPE

There is known to be a close relationship between the soil type (size of soil particles) and the method of applying water to make the most efficient use of it. This relationship has been referred to before, but it warrants further emphasis. With a given quantity of water available, for example, the best method of applying water to a compact, heavy soil may not be suitable for a loose, sandy soil.

Unless the method of applying irrigation water to the land is so adjusted to the soil type as to produce the maximum yield possible from that soil, the water will be used wastefully.

INADEQUATE TILLAGE EQUIPMENT

Inadequate tillage equipment wastes irrigation water. Much grain is planted late with resultant low yields because adequate tillage equipment is not available to prepare the seedbed in time for desirable early seeding.

Poorly prepared or improper seedbeds result from inadequate tillage equipment and produce low yields and low returns per unit of water used. Likewise, poor, uneven stands which are a common result of hand seeding practices, give poor yields per unit of water applied. Faulty weed control also results from poor tillage equipment and weeds waste water.

WASTE OF FLOOD WATER

Failure to use excess winter and spring flood water is wasteful. This type of waste is due partly to a lack of knowledge as to how to use that water effectively. In part it is due to the lack of mechanical equipment which would make it possible for the farmers to expand their cultivated areas of winter grains and forage crops so as to produce growth from the surplus water.

GENERAL RECOMMENDATIONS

The problems of wasteful use of irrigation water on farms in Iran can be solved largely by two measures. One is to make available adequate equipment for land levelling, for soil tillage, for seeding and for cultivating so that better yields can be produced from the water used. The scheme for introducing farm machinery under the Seven Year Plan should help solve that phase of the problem. The other means of solving the problem of water waste is through the program of education to be carried out by the proposed Research and Extension Institute.

Both science and skill are involved in using irrigation water to the best advantage in growing both agronomic and horticultural crops. The research workers to be located at the various agricultural experiment stations must plan and develop very soon a field testing program to establish sound principles and practices of water use. As soon as the problems are worked out for any crop and any given set of conditions, the agricultural extension personnel should develop and carry out schemes to get farmers to adopt the better methods. The result should be a more efficient use of water and a greater tonnage of crop products grown.